

Snohomish County Medical Examiner



Pathology Policies and Procedures

**This manual contains Pathology policies and procedures of the Medical Examiner's Office and supersedes all previous information relating to:
Pathology Policies and Procedure**

This Manual shall be effective on April 13, 2011 and will remain in effect until suspended by written directive.

Norman Thiersch, M.D., Chief Medical Examiner

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SECTION 1.0

Daily Work Flow (General)

1.1 Policy

It is the policy of the SCME to perform timely examination of all individuals that are brought to the office. This may include a full autopsy or limited to an external examination only. Regardless of the type of examination, documentation, including photographs and paperwork, shall be generated for every case.

The daily caseload of autopsies done in the county morgue shall start by 1100 hours to allow for completion and clean up without creating overtime or delay in release of the body. Cases brought in after 1100 hrs shall be done the following day. In exceptional circumstances, cases may start after 1100 hours. Cases brought in on the weekend will be routinely examined on the following Monday. Special circumstances or holidays may require that autopsies are performed on the weekends. The decision to perform autopsies on the weekend is up to the pathologist on call in consultation with the Chief Medical Examiner.

No food or drink is allowed in the morgue at any time and smoking is prohibited. Protective clothing is to be worn in accordance with the exposure control plan. Shoe covers or shoes designated for morgue use will be worn in the examination area. Clean shoe covers will be worn if wearing these shoes outside of the morgue. Ear protection is available if desired when using the Stryker saw.

Observation of the autopsy in the autopsy room is limited to medical examiner staff, law enforcement, prosecuting attorneys and medical staff involved in the case. Visitors from outside the office may view autopsies from the observation room only. Exceptions will be granted at the discretion of the Chief Medical Examiner.

1.2 Preparing the paperwork

At the beginning of each workday, paperwork is completed by the autopsy pathology assistant for the pathologists. This consists of labels, case worksheets, cassettes, DNA cards, clothing lists and medical therapy sheets. For specifics refer to Section 2.0 - Paperwork.

1.3 Removing bodies from refrigeration

In the morning, the bodies that will be autopsied or viewed that day shall be taken out of the refrigerator and moved into the main autopsy room for photographic preparation.

1.4 Photographing the body

Initial routine photographs are taken in the morning. For specific details, refer to Section 4.0 - Photography.

1.5 Undressing the body

After an initial photograph of the clothed body, the pathology assistant shall undress the body. The clothing is removed intact and laid out on the corresponding body bag for examination by pathologist. The pathology assistant shall refrain from cutting the clothing off the body whenever possible. Ligatures or similar devices shall not be removed before being examined and dictated by the pathologist.

1.6 External examination

In certain cases, an autopsy will not be performed on a body, but an external examination will be conducted. In most cases this is done by the pathologist. For specifics refer to **Sections 6.0, 14.1 and 14.4.**

1.7 Performing the autopsy

The method of organ removal at SCMEC is called the "modified Rokitansky method." The dissection begins below the neck and proceeds downward. All the organs of the trunk are removed from the body in one or two blocks. The Pathology Assistant assists in the evisceration. For specifics, refer to Section 7.0 - Performing the Autopsy.

1.8 Preparing the body for release

Following the autopsy, the organs shall be put back inside the body cavity and the body cavities and skin are closed with running suture. The body shall be cleaned, wrapped in a body bag, labeled and returned to the refrigerator.

For specifics refer to Section 8.0 - Preparation of Bodies for Release.

1.9 Ancillary duties

1.9.1 Photography file maintenance

Before 2009, 35mm slide film was used to back up digital images for all homicides and suspicious cases. The film was sent out to the photo lab for development only. The uncut film was then labeled by case number and filed in the record room. Since 2009, this has no longer been the case and all photography (including back-up copies) is digital.

1.9.2 Digital image maintenance

When the autopsy is complete, the images will be transferred from the memory card in the digital camera to the network drives and backed-up onto a CD. Autopsy images from each case are combined with the scene images in a file labeled with the case number on the network drive. The images are then relabeled with the case number. The image file is then burned to a CD-R for archival storage. These CD's, along with the mini CD's from the scene cameras, are then stored in the records room.

For specifics see Section 4.0 – Photography.

1.9.3 Histology

Cassettes that are prepared for histological examination are kept in 10% formalin overnight to allow tissue sections to fix before being processed. Be sure there is enough formalin in the container to cover all cassettes. If the formalin is discolored from blood and tissue, you may have to add fresh formalin or replace the formalin to ensure proper fixation. The formalin containers should not be overfilled with cassettes. There needs to be adequate room for the formalin to surround the cassettes for proper fixation.

The cassettes are picked up by courier for the histology lab. Chain of custody will be maintained on all cassettes leaving the office. The log of cassettes sent to the lab and slides returned back is kept in the METS database. The blocks are processed; cut and H&E slides are prepared. Special stains and recuts are performed as requested. Appropriate control slides must accompany all special stain slide requests. The histology lab has agreed to let us use their lab when a cryostat is needed. When the slides are brought back to our office they are compared to the blocks before being labeled. The slide folders are then placed in the pathologist's mailbox for evaluation.

1.9.4 Slide Filing

Slides that have been examined by the pathologist shall be checked as read and filed in the records room. Microscopic glass slides are retained indefinitely.

1.9.5 Block Filing

The blocks shall be filed in numerical order (by case number) and stored in the long-term tissue storage room located within the autopsy suite which is maintained at a cool temperature. The minimum NAME standards require that "paraffin blocks be stored in a cool area and retained for at least ten years"; we retain our paraffin blocks indefinitely.

1.9.6 Toxicology

Toxicology specimens shall be collected by the autopsy pathology assistant during the autopsy. The specimens are labeled and stored in the refrigerator until a pathology assistant is able to process and send the samples to the toxicology lab. For specifics refer to Section 10.0 - Toxicology specimen collection and handling.

1.9.7 Laundry

Autopsy laundry is to be done daily. Launder autopsy towels twice on the cotton/sturdy setting. The first cycle is a cold rinse with detergent and the second washing is with hot

water, detergent and bleach. Scrubs and shower towels are laundered in warm water with detergent and fabric softener.

1.9.8 Facility maintenance and supplies

1.9.8.1 Daily (after autopsy):

1. Clean surfaces of the autopsy station and body tray with bacterial and germicidal solution in usual fashion, making sure that all surfaces are free from organic debris. Check under movable panels to make sure all debris is gone.
2. Sweep the floor and then mop the entire floor at the end of the day.
3. All instruments should be cleaned, dried and replaced in cabinet where they are kept.
4. At the end of each workday, the station will be set up for the next morning.
5. Return all pathologists' tools to the storage drawer.
6. Make sure that the morgue office is straightened up at the end of the workday. All miscellaneous papers and x-rays will be filed.

1.9.8.2 Weekly:

1. Restock all supplies in the drawers: syringes, test tubes, needles, specimen cups, etc.
2. Scrub the morgue floor with the mechanical scrubber.
3. Restock the supplies in the x-ray room (i.e. gloves, bags).

1.9.8.3 Monthly:

1. Inventory the store room and order supplies

SECTION 2.0

PAPERWORK

2.1 POLICY

Documentation of the findings in a death plays a critical role in creating a permanent record for the case file. Most aspects of this office's investigation of a death, including investigations and pathology are covered by forms in METS. It is important that these forms be filled out as completely as possible, since they will become part of the permanent record for future reference, whether it is testimony in a criminal case or simply answering a family member's question about personal effects. If the information is not collected and documented in a methodical systematic way, it will not be there when the question is asked. The information in the forms described below complement and support other documents generated in this office, such as the autopsy report. In some cases, such as the property form, they may be the only record this office has of a piece of property.

All forms and paperwork (investigative and pathology) will be prepared and be made available for review by the Medical Examiner, before the autopsy.

2.2 Investigator report and case file

Every morning, the case files for the day's cases are picked up by the Pathology Assistant in the investigator area, in the file holder on the counter next to the case log book in Investigations. Along with the case files, the medical records and medical x-rays should be brought to the autopsy room for each case.

2.2 Toxicology Form

After autopsy, the Medical Examiner fills out a toxicology form in METS on each case, leaving blank the date sent and who it is sent by. When prepping the samples to be sent, the pathology assistant will fill in these two fields on the form and print it out.

2.3 Clothing Form

For each case the clothing is entered into the clothing form in METS. The Pathology Assistant should be non-specific when describing the clothing, as the Medical Examiner will go into greater detail in his/her dictation. However, the position of the clothing, zipped, cut or unzipped and if off/on the body should be noted. If there is anything unusual about the clothing (i.e., blood spatter, burns, stains etc.), stop and alert the Medical Examiner. The clothing should be placed on an adjacent table, right side out and in the position it was on the body.

2.4 Case worksheet/medical therapy

A case worksheet should be generated for all cases. Documentation of medical therapy placement and identification bands should be recorded on the body diagram. Age, weight, height and sex should also be recorded on this form in METS.

2.5 Case review sheet

A case review sheet will be generated by investigations.

2.6 External view forms

A variety of external forms are present in METS. Additional external view forms are found in the autopsy office. External views are performed and documented by the Medical Examiner. All other body examination forms are located on the METS database.

2.7 Labels

Labels for toxicology specimens collected during autopsy are generated in METS through the toxicology request page. This is done by entering the date and checking the boxes for “specimens collected” and then clicking “Make Labels”. Clothing, evidence and property labels are created by accessing the appropriate form on the METS database.

2.8 Body Release Authorization

Upon completion of the examination, identification of the body, and upon determination by the Medical Examiner that the body is ready for release, the Medical Examiner shall electronically authorize the release of the body and electronically sign the release form in METS.

SECTION 3.0

INITIAL PREPARATION OF BODIES

3.0 Policy

The consistent handling and processing of bodies is an important part of the autopsy process. Every time a body is examined in the autopsy area, it needs to be handled in the same way. Since we are not certain which cases will go to trial or come under greater scrutiny, it is important to do a basic level of examination and documentation that will allow the Medical Examiner to describe his findings and explain his conclusions to a family, a jury or another physician. The documentation needs to be sufficient so that the Medical Examiner performing the examination or another forensic pathologist looking at the case years in the future can come to a conclusion as to the cause and manner of death. It is important that these procedures are followed with every case, every time. If there is ever a question as to what happened with a case, the Medical Examiner, Pathology Assistant or anyone representing the office will have to be able to answer without hesitation that the standard procedures were followed.

3.1 Removing bodies from the morgue refrigerator

In the morning the bodies that will be autopsied or viewed that day are removed from the refrigerator, placed in the main autopsy room and prepared for initial photographs. The bodies will be in either a body bag or covered by a sheet with the specific case number written on the right side of the body. Be sure that this number matches the number on the ankle band. The body will be lying on its back, face up and with the head towards the top of the cart and feet towards the bottom.

3.2 Removing body from body bag (homicides)

The body will be in a body bag on cases where evidence needs to be preserved, generally homicides. A photograph of the sealed bag should be taken prior to removing the bag. The body bag should not be opened without the Medical Examiner's approval. After evidence is collected and photographs are obtained, the body can be removed from the bag. This is done by turning the body over to one side and tucking the sheet and bag underneath the body and then turning the body over the other direction and removing the sheet and bag. The bag or sheet should be checked for any property that may be still inside. The bag and sheet are handled in such a way so as to prevent trace evidence from falling out and becoming lost and are retained as evidence. A new bag is used when the body is ready for release.

3.3 Photographing the body clothed

The first photograph of the body that is taken is an overall photo of the body with the clothing on. Within the initial photo should be a marker board with

the case number and the date. This is a full lateral view taken from the right from an elevated position to show the condition of the body as it came into the office. The case number written on the right side of the body should be visible. After the initial “as is” photograph is taken, some cases will need additional photos of unique blood patterns, or unusual position and condition of the clothing, or evidentiary material. The Medical Examiner shall be notified of these findings before the clothing is removed. Specific details about clothing (i.e. position of clothing, is clothing on or off the body, belts fastened, etc.), shall be documented on the clothing form (non-homicides).

3.4 Undressing the body

After an initial photography of the clothed body, the body is disrobed. The clothing is removed intact and laid out on the corresponding body bag for examination by pathologist. The Pathology Assistant must refrain from cutting the clothing off the body whenever possible. The clothing is then examined for personal property.

3.5 Identifying and handling of found property

When property is found on the body or clothing by the Pathology Assistants, it is to be placed onto the cart (“dressing table”) next to the clothing and labeled with a marker where it was found (i.e., “right pants pocket”, “left wrist”, etc.). During examination of the clothing, the Medical Examiner will dictate any property found with the body. After it has been dictated, the property is placed into a small bag that is labeled with the case number and name; it is then given to the investigators. Significant or unusual items shall be brought to the Medical Examiner’s attention.

3.6 Documenting and removing medical therapy

All tape and therapeutic evidence is to be recorded on the body diagram and removed. Bandages and cardiac monitor patches should be removed in the easiest manner; I.V. lines should be cut and tied off as close to the point of insertion as possible. Endotracheal tubes should be cut off inside the mouth being careful not to disturb the position of the tube. Medical therapy is to be discarded in the bio-medical waste receptacle that is stored in the walk-in refrigerator.

3.7 Primer residue swabs

Primer residue swabs are taken on all cases where a firearm is involved. The hands are placed in paper bags at the scene to preserve evidence. Make sure the bags are labeled before removing them. Fold the bags into themselves so nothing of evidence will be lost in transport. Four separate nitric acid swabs are to be taken and placed into separate tubes. The first swab is a solution control swab moistened with the nitric acid solution. The second swab is a body control. Swab an area of the body away from the wounds, for example if there is a head wound, swab the leg or abdomen. Swab each hand separately. Thoroughly swab the palm, back and web of hand. Air-dry the swabs

before packaging each swab separately in labeled envelopes. In cases of suicide, attach the swabs to the outside of the gun box and place in evidence storage. In homicides the swabs are treated as any other evidence collected from the body. (Please also see section 12.3.2).

3.8 Washing the body

The body should now be cleaned of all debris and dried blood. When washing the body before the last photograph, the Pathology Assistant must be sure not to damage or scratch the body in any way. Using wet towels or a sponge is preferred. In the case of a gunshot wound, be sure that you don't wipe off any of the soot that may be around the entrance wound. All of the extra blood should be removed to avoid possible misinterpretation as trauma. The body should then be dried and the height and weight measured and recorded on the right side of the body and on the body diagram.

3.9 Photographing the body unclothed

A marker board containing case number, date and a ruler is to be placed in each photograph. For routine cases, once the body is undressed, 3 photographs are taken: one of the right side of the body, one of the left side of the body and a face/ identification shot. A photograph of the back should also be taken in all traffic accidents, homicides, bodies found outside and in cases of carbon monoxide (if lividity is posterior).

See Section 4.0 Photography for specific case types

SECTION 4.0

PHOTOGRAPHY

4.1 Preparing cameras for daily use

The cameras are located in the metal file cabinet in the autopsy office and should be ready for photographs.

4.2 Photographic Equipment

The photographic equipment used in the main morgue is a Nikon D2X camera system with a Profoto Compact Plus lighting system. The flash tubes can be triggered by infrared sensor or built in photocell. The lamp head contains a modeling light that will help to aim the flash. An audible signal will beep when the unit is fully recycled and ready to fire. Several units are positioned on an overhead rail system that allows various lighting configurations throughout the morgue.

For the routine overall shots, use the D2X digital camera; make sure the camera is set on manual and that the Nikor 24-120mm lens is attached; this is the primary lens that is used for the initial photographs. An 8-gigabyte (8 GB) flash memory card is used to capture the images from the camera. If, on the odd chance that this card is full, download the photos on to the T: drive and erase the card by selecting all the images on the flash card and right click the mouse. This will bring up the option to “delete”; select this option and the data will be erased from the flash card. Make sure the shutter speed is 1/320 sec. at f/16. A small hot shoe infrared generator is used to fire the main flash via a slave system. It is helpful to position a lamp head in front of the camera to ensure that the infrared signal is picked up. When the forward flash fires, the photocells in the overhead strobes will synchronize the flash. When using a close-up lens keep the flash head back at least 5 feet being careful not to shadow the flash with your body; use the same camera settings.

For macro photography, we use a Nikor 60mm lens. This is a specialized lens that is designed to capture small detail in high resolution. The field of focus for this lens is much shorter than that of the 24-120 mm lens. The light requirements are very similar as to those of the other lenses we have. However, from time to time you may encounter problems auto-focusing and may have to switch the auto-focus ring to manual and use the view finder to approximate the best field of focus.

The through-the-lens metering system meters on the film and will adjust the exposure settings to match the lighting. Be aware that you will get an error message, if there is too much light. Adjust the lamp heads to give even lighting and use the hot shoe mounted Nikon speed light to fire the strobes.

A specimen stand is located in the decomp morgue room. There are two 500-watt tungsten halogen lamps positioned at 45-degree angles to the specimen surface. Polarizing filters are placed in front of the lamps and another over-the-camera lens. The camera is mounted on the specimen stand column. Move the camera up and down the column and in or out to frame the specimen. Obtain a crisp focus and adjust the lighting to minimize shadows. Turn the polarizing filter on the lens to eliminate the glare and reflection of glistening surfaces. Include a ruler and case number in each frame. Bracket the full range of f/stops.

4.3 Positioning the body and the photographer

The body should be placed under and in between the two lamp heads with umbrellas. These lights are located away from the autopsy stations and allow an empty wall to be used as a neutral background. The overview should be taken from about 8-12 feet from the body on the top step of the rolling stepladder.

4.4 Initial routine photographs

When the bodies are moved from refrigeration and brought into the morgue, make note of the case number and name written on the body and identification band.

A marker board containing case number, date and a ruler is to be placed in each photograph taken. Images are captured with the digital camera, using the overhead studio lighting in the morgue.

Prior to examination or processing of trace evidence, each body is photographed for identification purposes by taking four views. The first photograph is a full body lateral view taken from an elevated position to show the condition of the body as it came in to the morgue. The next two photographs are taken after clothing and therapy have been removed and the body has been cleaned of blood and debris, so as not to obscure any injury or trauma. Include left and right lateral views. Ensure that the height and weight of the body has been written on the right side of the body, before the two lateral photographs are taken.

The fourth routine photograph is a close facial view to aid in identification. The photograph should be framed tight around the head with the number board under the chin.

4.5 Routine photographs of injuries and other lesions

There are certain cases where extra photographs are always required. An image of the back should be captured on all traffic cases, homicides and bodies found outside. In addition, in cases of carbon monoxide intoxication, the back should be photographed if the lividity pattern is posterior, as this helps document the cherry red lividity.

On traffic accidents involving a pedestrian, a large ruler is put alongside of the body, and the lower half of the body is photographed, beginning at the heel. This will help the investigators/Medical Examiners correlate injuries with the vehicle.

In hanging cases, a picture of the ligature and the ligature mark is required. This will take 4 pictures: front, back, left and right sides of the neck. Once the ligature is removed, it is placed next to the body's neck and photographed together in order to compare the abrasion furrow with the ligature.

At other times, additional photographs that should be taken include needle punctures or track marks from drug use and any other lesions or injuries that may be suspicious or unique to the individual case. Take two photographs, the first from far enough back to orient the location on the body, followed by a close-up.

Additional close-up photographs should be taken of specific injuries, unique body markings and identifying marks. When it may be difficult to make a positive ID, the Medical Examiner may request pictures to be taken of any identifying marks, such as tattoos. Place a ruler as close as possible to any identified wound, so that it will be in the same focal plane and accurately represent the size of the wound. The ruler used in close-up photography should be labeled with the case number. Again, when photographing tattoos, marks or injuries, two photographs should be taken. The first is an orientation photograph, taken far enough away to orient the location on the body and then followed by a close-up photograph. The ruler should not be positioned so that it covers or obscures the injury (or mark, tattoo, etc).

All weapons and ligatures should be photographed on the gray board using the marker board for identification. For cases that involve gunshot wounds, a picture is to be taken of the gun next to the wound. To prevent any transfer or contamination, the gun cannot touch the area of the wound. A small scale with case number and measuring increments must be included in this picture.

4.6 Specific photographs

Specific photographs would be those that are requested by the Medical Examiner, usually during the autopsy. During certain cases, the Medical Examiner will require photographs of the internal organs and body cavity of the decedent. To prepare for organ photography, the Pathology Assistant must prepare a neutral gray board, which is found in the morgue on the rack that holds personal protective equipment (PPE). The gray boards are located on the 2nd shelf of the PPE rack (the shelf that also holds gloves) and also behind the rack. Always be sure that the gray board is clean before placing the organs on top for the picture. Remove excess blood from the background

and blot the organ with a towel to minimize reflection. A ruler should be placed in all photographs with the case number. An overall shot should be taken to orient the location on the body and then a close-up of the portion of the organ or injury that is being focused on.

4.7 Downloading digital images to computer

After completion of the day's caseload, the flash card will be downloaded to the "T" drive through the use of a multi-card reader.

Navigate to the "T" drive and locate the case file to transfer the pictures to. If no case file exists, create a new folder for the case. Label the folder with the case number.

Insert the compact flash card in the card reader. Access the drive and move the images into the newly created folder.

On a monthly basis cases will be backed up to a recordable CD or DVD (this is with the exception of homicides and suspicious cases, which are backed up to a CD immediately). Open the CD creator program. Copy the folders with the images on to a recordable CD.

Replace the flash card into the camera and format the card.

SECTION 5.0

RADIOLOGY

5.1 Radiation safety and monitoring

The radiology equipment is registered with the state of Washington and inspected every four years in accordance with Chapter 246-220 WAC RADIATION PROTECTION – GENERAL PROVISIONS. The method of radiation monitoring is the Luxel whole-body dosimeter monitored by Landauer Inc. Staff members who are frequently exposed to radiation caused by x-ray machines wear these film badges on the lapel to monitor their level of radiation exposure. The badges are sent out quarterly and the individuals' radiation levels are tested. The radiation dosimetry reports are kept on file in the radiation safety notebook.

5.2 Equipment and initial preparation

The x-ray machine we use is a Continental HF series generator, located in a shielded room off the main morgue. The shielding is in compliance with Washington State standards. To operate the machine, first turn on the switch to the locks located on the viewing wall. An orange light signals the “on” position. This switch must be “on” before system power is applied, by pressing the “on” button at the control station. After the display stabilizes, follow the warm up procedure posted at the controls.

A lead apron and gloves are provided for exposure protection. The Trophy portable dental x-ray unit and supplies are kept in the isolation autopsy suite.

Located in the dark room is our digital x-ray. Before an x-ray can be processed and developed, a new case needs to be created in our digital x-ray system. To do this the server needs to be turned on, if not on already. On the main screen select the Image Pilot program. It will open up another screen which looks like it requires a password. No password is necessary, just hit “Enter” and the program will open. Select “New Exam” and enter the case number, then select “Create ID” and click yes. Once you have done this enter in the decedent's name and gender. Once this is done select “Perform Exam”, this will open a new screen. At the top of this screen select the option “CR”, it will highlight in blue once selected. Once you have done this you are ready to perform the exam. Cases are stored sequentially and can be searched and retrieved by case number.

5.3 Positioning the body and cassette for routine x-rays

Move the body into the room and position the x-ray tube over the body. The standard tube-to-film distance for a head film is 36” and is measured by the digital readout on the

front of the collimator. The distance for chest and KUB should be 40" from film cassette to the tube. Place the x-ray cassette into the grid of proper size in a red plastic bag with the marker aligned superiorly. The grid is used during all radiographs. Place the R-L marker in the appropriate position on the cassette. The next step is to frame the field of the x-ray beam by using the light collimator on the head of the machine. Frame the light beam so that it just covers the film cassette; the light turns off by itself. Make sure that the tube is in a parallel plane to the film cassette.

5.4 Routine x-rays

On most routine cases, x-rays are not needed. The exceptions are homicides, suicides where the cause of death is a gunshot wound, infants, aviation accidents and any case where the body is burned or decomposed to the point where one would not be able to recognize injuries on the body. It is important to x-ray the body on all burn cases even if the history appears straightforward so as not to miss occult injury. The suicide cases which involve a gunshot to the head require a head x-ray to visualize and document the presence of any projectile or fragments retained in the body.

5.4.1 Infant or suspected child abuse:

- Requires full body series of radiographs.
- AP head, chest, pelvis
- Arms and hands (rotate arms so they are in anatomical position)
- Legs and feet (rotate arms so they are in anatomical position)

5.4.2 Routine x-rays to be done on all homicides, severely burned bodies and decomposed bodies include:

- AP head
- AP chest
- AP pelvis

5.4.3 Other routine x-rays are on gunshot wound victims, both suicides and homicides. These x-rays should include:

- Any area of the body which has been shot.
- On homicides where the gunshot is to the head, both AP and lateral should be taken.

5.4.4 Aviation accidents:

- Requires full body series of radiographs.

5.5 Specific x-rays

Specific x-rays are those that are requested by the Medical Examiner after the routine x-rays have been taken. Some of these may include views of arms and legs or lateral head.

5.6 X-ray machine settings

Previously, before utilizing our current radiographic software, the settings for kilovolts (KV), milliamperes (MA) and time needed to be set accordingly for each film. These settings became somewhat standardized for our use and were (and still are) charted at the control station. For example, allowances for larger than average body size (greater A-P distance) could be made by increasing the settings. We have found that with our current digital x-ray image processing software, we are allowed to keep the settings essentially the same for all radiographs and the software makes all necessary corrections.

5.7 Taking the x-rays

Make sure the 'no Bucky' switch is selected. Push the ready prep button on the control panel. When the ready light comes on press and hold the exposure button expose the film.

OTHER EMPLOYEES SHOULD BE OUTSIDE OF THE CLOSED RADIOLOGY ROOM OR BEHIND THE CONTROL SCREEN WHEN THE EXPOSURE IS TAKEN. IN THE RARE EVENT THAT AN EMPLOYEE IS REQUIRED TO HOLD A BODY PART IN POSITION, TORSO SHIELDING (APRON) AND GLOVE SHIELDS WILL BE WORN.

Remember to wear your film badge to monitor your exposure.

5.8 Developing the x-rays

Before you can develop the digital film, you need to make sure "CR" on the computer screen is selected (see section 5.2). When ready to develop the film, find the side on the plate with the barcode. Line up the plate's barcode with the word "barcode" on the developer and place the plate into the opening on top of the processor. Once it senses the plate, it will automatically drop the plate into the processor and begin to digitally process the film. Once it is processed the plate will pop out of the same opening as you placed it in. The image will automatically display on the computer screen. While the plate is in the processor it automatically uploads it and then erases the image on the physical film, making it ready for use immediately when it is done. The software in the digital X-ray system processes the information from the plate and produces an optimized image.

5.9 Displaying the x-rays

Any x-rays taken should be left open and up on the computer screen in the dark room, for the Medical Examiner to look at.

Any hard copy x-ray images should be displayed for the Medical Examiner on the X-RAY board in the small office located in the autopsy room.

5.10 Labeling and filing of the x-rays

After each case is completed, the images need to be transferred to the photo file for the appropriate case. For instruction on transferring, see section 5.10.

After the case has been completed, any hard copy films are placed in a labeled folder and filed by case number in the record storage room.

5.11 Transferring .JPG radiology images to flash card.

When a CR image is to be imported into the Photo Case file on the T-drive:

5.11.1 Take the card reader from the morgue office and the memory card labeled “x-rays” from the top left drawer in morgue office.

5.11.2 Plug the card reader into one of the USB ports on the front of the Image Pilot server and insert the memory card into the reader.

5.11.3 From the main Viewer Screen select the option “Write” from the top green colored tool bar. (Note this is next to the pink colored tool bar that you use to select “CR” from when performing an exam).

5.11.4 Click once on “Write”. A window will pop up with all of the images taken on that case.

5.11.5 Below the images is a “Select All Images” button, click this once. After doing so the images will be highlighted in blue. (Note: You can choose which images you want transferred but it is procedure that all images taken be placed in the photo case file).

5.11.6 After selecting the desired images click “Write” at the bottom of the pop-up screen. (Note you do not need to select a drive. You have already plugged the reader in with the memory card and it will recognize this and send the images there).

5.11.7 The images will now be on the memory card.

5.11.8 Take the card reader and memory card to the main autopsy computer and plug it into the USB port on the tower. The computer will recognize the card and prompt you to open the folder they are located in. (Note this is the same procedure as if you were transferring photos taken during autopsy).

5.11.9 Select from the “T-drive” the correct photo case file. Open this file on the computer.

5.11.10 Highlight and select the images from the memory card screen. Once you’ve done this you can drag the selected images into the photo case file in the “T-drive”. Afterwards rename the images with the case number (i.e. 10SN----).

5.11.11 Close the T: drive and select all the images that are still present on the memory card. Right click over one of the highlighted images and select the [Delete] option. This will remove the images from the flash card.

5.11.12 Replace the memory card back into the top left drawer in the morgue office. Leave the card reader plugged into the computer in the morgue office for additional use.

SECTION 6.0

EXTERNAL EXAMINATION

6.1 Policy

The decision to perform an autopsy or external examination remains with the Medical Examiner (see Section 14.1, Criteria for Autopsy). On certain cases where enough history is obtained to substantiate a probable cause of death or in the case where the private physician is unavailable or unwilling to sign the death certificate, the body may be brought in to the morgue for viewing. In these cases and others where the Medical Examiner determines that an internal dissection will not be required, a thorough external examination shall be performed to document evidence that supports the probable cause of death and rules out other possible causes of death.

6.2 Preparation

The body is prepared and photographed as in the standard autopsy protocol (see Sections 3.0 and 4.0).

6.2.1 Special considerations for suicide gunshot wounds of head

Additional preparation for suicide gunshot wounds of the head shall include: 1) x-ray of the head; 2) primer residue swabs; and 3) the weapon and ammunition should be photographed on the gray board. Photos of the weapon next to the wound should be taken, being sure **not** to touch the weapon to the wound or skin.

Suicide gunshot wounds of other parts of the body may be considered for an external examination.

6.3 Collection of Samples

In external examination only cases, after the body has been examined by the Medical Examiner, samples of blood, urine and vitreous should be collected. Blind needle sticks to the heart to collect blood shall not be performed. Blood should be obtained peripherally from the femoral veins. A cut-down incision to visualize the vessel may be necessary. If peripheral blood cannot be obtained, inform the Medical Examiner. Samples shall be preserved as follows:

6.3.1 Two gray top vacutainer tubes of peripheral blood (ensure the preservative is gently mixed with the sample);

6.3.2 Two red top vacutainer tubes of urine (if possible);

6.3.3 Two red top vacutainer tubes of vitreous (split the sample equally into two tubes).

6.4 Preparation of body for release

The body shall be placed into a clean body bag and placed back into refrigeration to await release and removal as stated in the general autopsy procedure (see Sections 8.5 -8.8).

Section 7.0

PERFORMING THE AUTOPSY

7.1 Policies

1. Criteria for the determination of whether complete autopsy, partial autopsy or external examination only are found in **Section 14.0**.
2. All cases of homicide, all cases where homicide is suspected and all cases where the manner of death is undetermined at the time of autopsy will receive complete autopsies (see **Section 12.0** for a description of the related procedure).
3. Prior to autopsy, the circumstances of death, if known will be reviewed. (This is typically accomplished at the morning case review conference.)
4. The Medical Examiner responsible for a particular case *that is autopsied* will personally examine and document all external aspects of the body in advance of dissection. (NOTE: This does not preclude the occasional scene view external examination as described in **Section 14.0**).
5. The Medical Examiner responsible for the case will personally be responsible for the conduct of the postmortem examination, the diagnoses made, the opinions formed and any subsequent opinion testimony.
6. All autopsy ex-situ dissections will be personally performed by the Medical Examiner responsible for the case.
7. All pathology assistance rendered by SCMEO forensic Pathology Assistants will be performed in the presence of and under the direct supervision of the Medical Examiner responsible for the case. (NOTE: that this does not preclude pre-autopsy preparation steps as found in **Sections 1.2 – 1.5**).
8. Specimens will be routinely retained for toxicological and histological examinations during all complete autopsies. Specimens will be routinely retained for toxicological examinations during all external only examinations.
9. Radiographic examinations during autopsy will be performed as described elsewhere in this manual (see **Sections 5.4 and 5.5**).

7.2 Personal protective equipment for autopsies/safety

ALL PERSONNEL AND OBSERVERS WITHIN THE AUTOPSY AREA SHALL WEAR PERSONAL PROTECTIVE EQUIPMENT AND ADHERE TO PROCEDURES, AS DIRECTED BY THE SNOHOMISH COUNTY SAFETY AND HEALTH EMPLOYEE HANDBOOK and in the SNOHOMISH COUNTY MEDICAL EXAMINER'S OFFICE SAFETY POLICY AND PROCEDURES MANUAL.

Every time you pick up surgical instruments to begin work on a body be aware of the potential of the case to contaminate the work area and infect you through direct contact with the body fluids. Treat each case as infectious, because we seldom have the full medical history at the time of autopsy. Use appropriate care with sharps and leave the

dissection to one person at a time, as more than one pair of hands in the body cavity invites accidental needle sticks and other sharp injuries.

When dressing for the autopsy, the Pathology Assistant and Medical Examiner will wear:

- One long-sleeved Tyvek or surgical gown. Cut holes in the wristbands and place over thumb to prevent the sleeves from slipping.
- One N.95 mask over the mouth and nose (requires fit-testing).
- Eye protection (splash proof eye glasses or goggles)
- One pair of latex gloves.
- One pair of cut resistant gloves (non-dominant hand at a minimum)
- One pair of blue latex gloves.
- One pair of sleeve protectors. Cut holes near the wristband and place over thumb to prevent slipping.
- Head covering if desired.
- Ear protection if desired.
- Shoe covers (or dedicated autopsy shoes to be used only within autopsy areas).

7.3 Instruments

The instruments used are subject to personal preference, but the following are recommended:

1. Scalpel;
2. Fillet type knife;
3. Curved, blunt point dissecting scissors;
4. Straight sharp-blunt scissors;
5. Kocher clamps;
6. Large syringes;
7. Small disposable syringe for vitreous humor;
8. Dissecting forceps;
9. Curved sewing needle;
10. Rib shears.

7.4 Setting up the autopsy station

Prior to the autopsy, the following should be prepared and placed at the station.

- A stock jar filled with formalin to adequately cover the tissue samples. The jar should have a plastic label with case number placed inside as a double check. On the exterior surface, there will be a METS computer-generated label that contains the case number, type of contents ("stock tissue"), name of the deceased, the name of the responsible Medical Examiner, initials of the Pathology Assistant securing the specimen and a formalin warning.

- A small biohazard specimen bag. The bag should have the “Liver and Muscle” label placed inside the document portion of the bag so that it will not be lost in the freezer.
- Filter paper is labeled for a DNA sample.
- A bucket lined with a plastic viscera bag is prepared.
- The dissecting station should be set up with the Medical Examiner’s instruments.
- Two cassettes, labeled with the case number (i.e., 04SN0011); seven cassettes for SIDS cases). (In certain cases, the Medical Examiner may ask for additional cassettes).

The following specimen containers should be set up at the station:

- A specimen container for gastric contents;
- 4 gray top vacutainers (3 blood, 1 bile); and
- 4 red top vacutainers (2 urine, 2 vitreous).

Each sample taken is labeled with computer-generated labels with the case number, decedent’s name, date and type of sample.

7.5 Opening the body cavities

Do not begin the autopsy without the approval of the Medical Examiner. It is important to be aware of trauma and abnormalities as you eviscerate the body. Underlying contusions require measurement and fractures need to be documented. If you come across anything unexpected, **STOP**, and inform the Medical Examiner before continuing the dissection. For example, you should not proceed if you were to find blood in the pleural or pericardial cavities. Be aware of artifact that you create with your procedures and keep communication open with the Medical Examiner; look for the unexpected and work together.

The body is routinely opened with a scalpel using the standard Y-shaped incision. Note that this incision may have to be modified in some cases to avoid certain wounds (i.e., gunshot wounds, knife wounds). Place a block under the back just below the shoulders to allow easier access to the neck. When opening the body, an incision is made in the midline from the pubis to the xiphoid process. The incision then extends onto the chest where it forks, extending through the pectoralis musculature and over each shoulder, thus creating a “Y” shape. The skin and muscle are separated from the rib cage and the neck flap is reflected up over the clavicles. If the cadaver is female, at the Medical Examiner’s discretion breast tissue may be taken at this point for histology or to place into the stock tissue pot. At this point in the procedure, you should check for tension pneumothorax, if needed. The chest plate is removed by cutting laterally through the ribs with the rib shears, starting from the inferior aspect and angling up to the sternoclavicular notch. Lift the chest plate while separating it from the diaphragm and the thoracic viscera using a fillet-type knife. You will have to incise some

intercostal muscle along your lateral cut and finish by disarticulating the chest plate at the sternoclavicular joint. Removing the chest plate does not involve any major vessels and should be a blood-free procedure.

Visually inspect the thoracic and abdominal organs for abnormalities, adhesions and signs of trauma. If you observe unexpected trauma or other unexpected findings, **STOP**, and tell the Medical Examiner before proceeding. Any fluid accumulation in either cavity should be collected and measured at this time. Routine samples are taken before the organs are eviscerated (see related text, section 7.6).

7.6 Removal of Viscera

The preferred method of dissection at the SCMEO is a **modified Rokitansky** procedure. The organs are removed in three blocks using this procedure.

7.6.1 Intestinal Block

Remove the intestinal block by first freeing up the ascending and transverse colon by applying lifting traction at the ileocecal junction, noting the presence or absence of a vermiform appendix. If present, retain a portion of the appendix with the stock tissue. Cut the greater omentum and the transverse mesocolon up to and along the greater curvature of the stomach while applying traction. Next free the small bowel by lifting and cutting through the ligament of Treitz at the root of the mesentery (posteriorly). Clamp off and cut through the small intestine at the duodenojejunal junction. After freeing the descending and sigmoid colon, milk the contents of the rectum backwards and transect at the anus. Note the presence of diverticuli, discoloration of the bowel and any other remarkable characteristics.

7.6.2 Thoracic Block

Remove the thymus gland, if it is still distinct. The thymus progressively atrophies after the second year of life to fibrotic fatty tissue. It is easiest to dissect the bilobed thymus from the thin fascia before opening the pericardium to collect central blood. Be careful not to cut the innominate vein on the left side of the aortic arch running just superior and anterior to the aortic arch.

In infant autopsies the thymus gland is removed first before removing the thoracic block. This is done by dissecting the thymus along the fascial plane. When removing the thymus be careful to not nick or cut any of the vessels as you approach the aortic arch, as this will cause blood loss.

To remove the thoracic block, start by opening the pericardium and separating it from the heart along the arch of the aorta. You would check for air embolism if required after opening the pericardium. At this point central blood is drawn for a sample (see

related text sec 7.7). Using a scalpel or knife, score the posterior mediastinum along each side of the thoracic spine. At this point, the neck vessels are “tied off” by dissecting out the three vessels of the arch and cutting the vessels just above the arch. To do this, the large vessels to the neck are isolated and ligated at their origins from the aortic arch with autopsy twine. Once ligated, they should be transected below the level of the ligations (“tying off the neck vessels” will facilitate the embalming process by the funeral home). Continue your dissection posteriorly, transecting the trachea and esophagus.

Grasping the trachea along the incision and applying a lifting pressure, free the block as far down as the diaphragm. The final cut through the aorta, esophagus and pericardial sac at the diaphragm will allow complete removal of the block.

7.6.3 Abdominal Block

Before removal of the abdominal block, peripheral blood and bile samples should be drawn (see related text in section 7.7). The removal of the abdominal block is accomplished by freeing one side and then the other. Lift the liver and cut the diaphragm and connecting ligaments from the lateral and posterior wall working from the outside edge to midline. Grasp the right kidney and while applying pressure cut through the surrounding fat and connective tissue. Continue your dissection to the lumbar spine. Score along the lumbar-sacral spine at the edge of the psoas muscle, being careful not to cut into the abdominal aorta or the vena cava. Follow the same procedure on the other side while making sure that your cut is deep enough to free all the organs on the left side without damaging the pancreas or (the easily damaged) spleen. The block should now come free with a lifting motion; the final cut transects the abdominal aorta just above its bifurcation with the iliac vessels.

After collecting as much urine as possible via syringe, open the bladder and inspect the bladder for any residual urine, anatomical or pathological irregularities, abnormalities and calculi. If the cadaver is male, remove one of the testes by using a combination of blunt and sharp dissection through the peritoneum and soft tissue anterior to the bladder; continue this dissection through to the scrotum. After a passage has been opened into the inguinal area on each side, the testes can then be pulled out of the scrotum and bisected for examination. The prostate gland is isolated with blunt dissection. A small section of testis and a cross section of the prostate gland are retained in the stock tissue pot. If the cadaver is female, remove the uterus and ovaries for the Medical Examiner to dissect.

7.6.4 The Head

The head, like the thorax, is opened in a manner which leaves no disfigurement. After cosmetic alteration at the funeral home, the body should be able to be viewed without visible evidence that an autopsy was ever performed. Elevating the head with a head block will give better positioning and access to the back of the head. Wetting down the hair and parting it along the line where the incision will be made will reduce the amount of hair cut off. Make your incision from ear to ear across the occipital bone with the scalpel blade inverted to avoid cutting off hair that will be able to help hide the incision during viewing. Reflect the portion of the scalp above the incision over the forehead (to the frontal eminence), using a clamp to apply traction while cutting the underlying connective tissue with a scalpel. Reflect the bottom portion to a point below the occipital protuberance in the same fashion; make note of any subgaleal contusions or hemorrhagic areas. Incise the temporalis muscle on each side along the proposed saw cut. Using the Stryker saw, make a cut in a circular fashion around the skull, making notches at the temporal bones. This will prevent the skull cap from slipping during funeral proceedings. Cut through the skull while making sure you don't get too deep and cut into the brain. Remove the calvarium using a T-bar chisel, leaving the dura mater attached to the brain. You may have to slip your hand inside the bone and place it on the dura, to gently detach the dura from the bone. Do not pull on the brain. Cut the dura free at the anterior saw cut on the skull and fold it downward, separating it from the arachnoid mater along the longitudinal surface of the brain.

Make a note of any subdural or subarachnoid irregularities and contact the Medical Examiner if anything unexpected is seen. Pull back on the frontal pole of the brain while cradling the occipital pole with the other hand. Lift the olfactory nerves off the anterior cranial fossa and cut the optic nerves, the internal carotids and the facial/cranial nerve bundles. Care should be taken to keep the brain supported so that the brainstem does not tear or stretch. Cut the dura over the cerebellum at the base of the skull (tentorium cerebelli) from midline lateral to the saw cut. Cut the vertebral artery and cranial nerves along each side of the brainstem and transect the spinal cord/medulla as far down as possible. While cradling the cerebrum free the cerebellum and lift out the brain. Remove the pituitary and place it in the stock tissue pot.

7.6.5 The Neck

The routine neck dissection is performed after the brain has been removed to allow drainage of blood. In special cases, the Medical Examiner will perform a layered neck dissection in-situ, usually followed by photography of the strap muscles (which typically are then extended out onto clean towels spanning above and below the neck dissection area; this is followed by photography). During the dissection, if any unexplained trauma or hemorrhage is seen in the neck, consult with the Medical Examiner immediately. A Kocher clamp attached to the trachea gives a good grasp for

applying traction. Be careful not to injure the carotid arteries. If the artery is cut, stop and tie off the artery, especially if it is cut high in the neck. When removing the neck block, be aware of the location of the hyoid bone, so as not to introduce artifactual damage.

7.6.5.1 Anterior Neck Dissection with Removal of the Tongue.

The removal of the neck organs with examination of the tongue should be performed as a part of every medicolegal autopsy. Fresh bite marks give support to the possibility that a seizure preceded death. Also, a good view of the upper air passage can be obtained for examination for possible foreign bodies. After the chest organs and the brain have been removed, the shoulder region of the body should be elevated on a board or head rest. Reflect the skin of chest and neck to the level of the mandible. In order to free the flap to this level, you will need to dissect out to the shoulder (deltoid muscle). The layers of tissue of the anterior neck should be examined to reveal any hemorrhage within the muscle or soft tissue. The carotid arteries on each side should be identified and preserved so that the body can be properly embalmed at a later time. A knife should be inserted beneath the mandible in the area of the symphysis and pushed through the floor of the mouth. The tip of the knife will emerge under the tongue. Cut along each side of the mandible to the angle of the mandible, using care to avoid severing the carotid arteries. The tissue is then freed beneath the mandibular arch and the soft palate is cut to include the uvula and tonsils with the tongue and neck organs to be removed. The esophagus and trachea are freed from the tissue posteriorly and the neck organs along with the tongue are removed. The tongue is examined for evidence of fresh bite marks and the oropharynx and hypopharynx are examined for lesions or foreign bodies obstructing the air passages. The structures of the neck should be examined more closely by removing all tissue and muscle from the bone and cartilage with the sharp end of a scalpel in a scraping motion. Any hemorrhage or fractures of the bone or cartilage should be noted. The greater horns of the hyoid bone and the superior horns of the thyroid cartilage are particularly prone to fracture and should be carefully examined. The larynx and trachea should be opened posteriorly and any lesions or foreign bodies identified.

7.6.5.2 Posterior Dissection of the Neck.

When there is the possibility of injury to the cervical spine, as in falls or in whiplash trauma, the neck should be examined from the posterior approach. Before dissection, X-rays should be taken of the cervical spine. After the brain, neck organs and chest organs have been removed, the body is placed face down with a board or head rest under the shoulder region. The head is flexed and a midline incision is made on the back of the neck. The tissues are dissected layer by layer to document any hemorrhage. After the tissues have been cleared from the vertebral column, the vertebrae should be examined for evidence of fractures. The laminae of the cervical vertebrae can be cut and the spinal cord visualized. After removal of the spinal cord, the vertebrae should be examined again for hemorrhage and/or instability.

7.7 Routine sample collection

Body fluids are routinely collected on all cases that are either autopsied or have an external exam only.

Gray top vacutainer tubes are used for the collection of both blood and bile; red top vacutainer tubes are used for urine and vitreous. These tubes are available from the state toxicology lab. Gray top tubes contain sodium fluoride and potassium oxalate, which preserve the sample by inhibiting enzymes and bacterial growth. For example, by inhibiting enzymatic activity, the preservatives in the gray top tube can prevent in-the-tube (in-vitro) breakdown of ethanol and cocaine. Vitreous humor is obtained on each case and the sample is split into half, with each half placed into a red top vacutainer tube (which is sterile and without additives).

Toxicology samples are saved for three months (typically six to eight weeks after the case has been signed out). All samples are paired with the sections of liver and muscle taken during autopsy and stored in the freezer. All samples are to be stored in the refrigerator except the liver and muscle samples, which are stored in the freezer. All samples from homicide and undetermined cases are kept indefinitely in the freezer.

Primer residue swabs are taken on all cases where firearms are involved (see related text) and are placed in red vacutainer tubes after they have been dried. The primer swabs are packaged and kept with the firearm.

7.7.1 Peripheral blood

Two gray top tubes of blood should be collected from the femoral vein, inferior vena cava, or another peripheral site. The preferred sample site for a drug overdose is from the femoral vein. In cases with excessive exsanguination, the legs can be elevated and blood can be “milked” from them by massaging from distal to proximal end.

7.7.1.1 Central Blood

One gray top tube is to be collected from the aortic arch or directly from the heart. If blood is difficult to obtain from the aorta try the pulmonary vessels.

7.7.1.2 Other blood/fluid samples

In the event that blood samples are unobtainable from the vessels, blood should be collected from the spleen after the Medical Examiner has examined the organ. Consult with the Medical Examiner if you are having trouble collecting blood. Body cavity blood or decomposition fluid should only be collected if no other blood can be drawn. If there is a subdural hematoma, a sample should be obtained from this collection of blood, only after the Medical Examiner has examined the hematoma and it has been measured.

7.7.1.3 DNA Analysis

A dried blood sample is to be retained in each case for DNA analysis. Place several drops of blood on a piece of filter paper. From the sheet of labels for the case, choose the blood sample label. A second case number appears in the corner. Tear this corner off and use it to label the filter paper. The rest of the label goes on the envelope. Once the sample has dried, place the filter paper in the labeled envelope and file it in the cytology area. The sample is kept indefinitely.

7.7.2 Bile

Collect and measure all the bile in the gall bladder. Fill one gray top tube and discard the rest. Note the color of the bile and the presence and relative size of any stones that may be present.

7.7.3 Urine

Collect and measure all the urine in the bladder. Save two red top tubes and discard the rest. Note any unusual color or turbidity. Open the bladder to be sure that all the urine has been obtained. Examine the bladder wall and interior for any abnormalities such as tumors, calculi or thickening.

7.7.4 Vitreous

Collect vitreous from each eye with a sterile syringe and divide into two red top tubes.

7.7.5 Gastric

Make a small incision to the stomach along the greater curvature and collect entire contents into a graduated pitcher. Note the amount collected and its appearance. Do not discard until the Medical Examiner has examined the contents. Save about 50cc in a specimen container. If pills and/or fragments are present make sure to include in the saved portion (note: the Medical Examiner may also want to have this photographically documented).

7.7.6 Liver & Muscle

A small section of liver (100gms) is obtained after the dissection and placed into a small plastic bag. A 100 gram sample of psoas muscle is obtained and placed into the bag with the liver. A computer-generated label is placed on the bag. The bag is sealed after removing as much air as possible and stored in the freezer.

7.7.7 Other tissue samples

A small sample of skin, muscle, bone and appendix, (if present), are collected and placed in the stock tissue container.

The pituitary is dissected out of the sella turcica or pituitary fossa and placed in the stock container.

Testis and prostate are to be sampled after dissection and placed into stock also.

7.8 Special procedures

There will be times when the Medical Examiner will ask the Pathology Assistant to do special procedures during the autopsy.

For specifics refer to Section 9.0 - Specific Autopsy Procedures.

7.9 Stock Tissue Container and Cassettes

As a general principle, it is important that autopsy tissue and fluid specimens be individually collected, adequately packaged, properly labeled, appropriately preserved and archived using a consistent and logical numbering system.

Labeling of stock tissue is described in section 7.4.

After the autopsy, the stock tissue container is filled to the top with formalin and a paper towel may be placed inside to make sure that the tissue samples floating on the top will be evenly fixed. After the autopsy, the tissue is allowed to fix in formalin for a month. It is then transferred to a bag, with a small amount of formalin and sealed in the bag. On routine cases, the tissue is kept for five years and then destroyed. For all homicides and undetermined cases, the tissue is kept indefinitely (see related text, section 11.4). The histology cassettes are placed into a labeled container of formalin to fix until they can be processed. Every case that is autopsied will have formalin fixed tissue retained and paraffin-embedded tissues made into glass slides for review. All the containers used to transfer specimens should be cleaned and rinsed with disinfectant prior to storage or transfer.

SECTION 8

Preparation of Bodies for Release

8.1 Returning viscera to body cavity

The closing of the body is done in a manner that will contain the organs and body fluids during transport to the funeral home. The body cavity will be opened again for the embalming process and the aim is for a clean transport. After the organs have been dissected and stock tissue samples have been obtained, the organs are placed in the viscera bucket lined with a heavy plastic bag. Evacuate any accumulation of blood in the body cavity. The bag is closed by twisting the top of the bag upon itself and held closed by the chest plate; it is placed into the body cavity, the chest plate is replaced and the body cavity closed.

8.2 Sewing the Body

Close the body cavity and head using heavy linen thread and a “S”- shaped needle using a baseball/rolling stitch. The stitch should extend from the sternum to the pubic bone, making sure to include the flap of skin from the neck.

8.3 Sewing the Head

After the calvarium has been replaced, the scalp should be pulled back into place. The same S-shaped needle and thread should be used for closing the head. The stitch should extend the length of the cut.

8.4 Washing the Body

After the body is closed, wash and dry the body and table to wash off any excess blood. This should be done using the hose extending off the main sink at the station. A towel can be used to dry the body.

8.5 Moving the Body

The body is moved from the autopsy tray to the body bag with use of a Gantry Lift. Place two nylon lifting straps under the middle of the back of the body. Ensure that they are equally spaced under the decedent. Next slide the chain driven hoist over the body. Push the “down arrow” button on the control pendant and the hoist bar will lower to the desired height. The lifting straps have two sewn eyes at their ends these are placed over the L-shaped angle that is at the ends of yellow steel lifting bar. Ensure that the straps are equally centered under the body to not cause the decedent to be swung when lifted. Lifting is accomplished by pressing the “up arrow” on the pendant station; the body will then be slowly lifted off the tray. Raise the body to a couple of inches off the tray, just enough to clear the raised edges of the autopsy tray. Ensure the dressing table and body bag is in place to capture the body and any fluid that may spill. While leaning over the dressing table, grab both straps and pull the decedent towards you. Center the body over the dressing table and body bag. Push the lower button on the pendant station and the body will slowly be lowered into position in the body bag. At

this point you will remove the straps from the body by pulling them out from under their back with a smooth pulling motion from either the right or left side of the dressing table.

8.6 Inclusion of Clothing in Body Wrapping

The clothing should be put into a plastic bag and labeled with the case number. The clothing bag should be placed at the foot area of the body and is bagged with the body in the body bag. This is required on all cases that have clothing.

8.7 Labeling the Body for Release

After the body has been wrapped and bagged, ensure that the SCME case number and name are written on the outside of the body bag using a black permanent marker. Two people shall check the identification of the body and initial a label to document this verification. The label is placed inside an adhesive backed document envelope which is then attached to the outside plastic of the wrapped body before it is returned to the refrigerator.

8.8 Returning the Body to the Cooler

Once the body has been bagged and labeled, it is returned to the walk-in refrigerator. The body will be held in the walk in refrigerator until released by the investigative staff.

8.9 Clean Up of the Autopsy Station

DO NOT ERASE THE BOARD WITH ORGAN WEIGHTS UNTIL THE FOLLOWING DAY or until you have checked with the Medical Examiner.

The following tasks will be done at the end of the day when autopsies have been completed:

- (i) Clean and disinfect instruments and viscera buckets.
- (ii) Clean, disinfect and dry autopsy station.
- (iii) Red bagged garbage is to be emptied into the biohazard burn boxes in the main body refrigerator.

SECTION 9.0

SPECIFIC AUTOPSY PROCEDURES

9.1 Infant Autopsy Procedures

The infant autopsy is done in a manner much like that of the routine autopsy. The Medical Examiner will need a minimum of six cassettes. These cassettes will be sent out for routine histological processing and any additional stains that the pathologist requests. Smaller, more delicate instruments are available in the drawer under the dissection area of the autopsy station. The photography is the same with the exception that another photo is added to the routine; a shot of the back.

Full body x-rays are performed. Use a separate x-ray cassette for the head and each limb being careful to keep the body in anatomic position which allows separation of the long bones without overlap. This is particularly important for the bones of the forearms. The hands should also be flat.

The body weight is measured in both standard and metric units and documented on the case worksheet. Crown to heel length, crown to rump length, head, chest and abdominal circumference measurements and foot length are obtained in both inches and centimeters and recorded on the body diagram in METS.

VITREOUS IS NOT COLLECTED UNTIL AFTER THE BRAIN IS REMOVED AND YOU HAVE THE MEDICAL EXAMINER'S PERMISSION. Removal of vitreous may create artifactual injury and must not be taken if there are suspicious circumstances surrounding the death.

The body is opened in the usual manner and the chest plate is removed.

After the Medical Examiner has examined the chest plate, a portion of rib including the costal-chondral junction is taken and placed in the stock tissue pot. Skin, muscle and appendix, are placed in stock as well.

Examine the internal organs for abnormalities, petechial hemorrhage and signs of trauma. Stop immediately and contact the Medical Examiner if there is any abnormality or evidence of trauma. Examine the bowel as it is removed from the abdominal cavity.

Dissect out the thymus and collect blood, bile and urine samples. Small drops of blood are placed on filter paper for DNA and metabolic screening. The filter card/forms for the metabolic screen are located in the morgue office.

The thoracic and abdominal organs are removed together in one block by combining the techniques for the removal of the blocks separately.

The scalp incision should be made well back on the occipital skull as infants usually don't have enough hair to hide the incision. **BEFORE REMOVING THE SKULL, INFORM THE MEDICAL EXAMINER YOU ARE REMOVING THE BRAIN. DO NOT REMOVE THE BRAIN UNTIL THE MEDICAL EXAMINER IS PRESENT TO VISUALIZE ANY POSSIBLE INJURY.** The infant brain is much more fragile than that of the adult and extra care is needed when removing it from the cranium. There may be, on occasion, times when removal of the calvarium is done under water to float the brain while completing the removal, especially in fetuses, due to the unmyelinated state of the brain. Dissect out the pituitary and place in with the stock tissue.

Vitreous can now be obtained with the Medical Examiner's permission.

Remove the neck organs in the usual fashion.

An incision is made posteriorly in the midline, from the occiput to the sacrum and is continued down the buttocks and onto the thighs. The incision should be deep enough to examine the underlying musculature. Dissect the skin of the back laterally to visualize the soft tissue and musculature of the back. Remove the complete spinal cord posteriorly.

The rest of the autopsy, closing and clean up, follows the same protocol as the standard autopsy.

9.2 Special Neck Procedures

In cases where neck trauma is evident, such as in hangings or traffic accidents, the Medical Examiner may indicate that they will do the neck removal themselves or ask to be present during removal. This is most important during homicides, where all evidence is to be preserved as much as possible. Depending upon the Medical Examiner's preference, a layered dissection of the anterior neck may be requested. Follow the direction of the Medical Examiner, as to how they want this done.

9.3 Spinal cord removal

9.3.1 Anterior:

An anterior spinal cord removal may be done once the organ evisceration is complete. Occasionally the Medical Examiner will require a certain portion of the spinal cord to be removed.

Using the Stryker saw, make a transverse cut through the vertebral column above the portion of cord requested by the Medical Examiner and another transverse cut below the area of cord desired. Now two lateral cuts with the saw are required on either side of the vertebral column. It helps if these cuts are slightly slanted towards the center of the body rather than straight down, but be sure that you don't damage the spinal cord. Once the cuts are made the vertebral column can be removed exposing the spinal cord. Hold onto the dura, not the cord, with forceps and be careful not to pull on the cord, as you dissect and release the attachments holding the cord in place. This should finalize the anterior cord removal.

9.3.2 Posterior:

A posterior spinal cord removal is performed on infant cases. It is similar to the anterior cord removal, except that it is done posteriorly, with these other exceptions:

- A midline cut is made from the posterior neck, down the back and down the buttocks. The skin and soft tissue are reflected back to expose the vertebral column.
- Follow the procedure above to expose the spinal cord making sure that you remove the cord intact from the base of the skull all the way to the cauda equina. Do not pull on the cord; use forceps to hold on to the dura, not the cord itself.
- After the cord is removed and the Medical Examiner has examined the area for injury, the incision must be sewed up using the baseball stitch.

9.4 Posterior neck dissection

Posterior neck dissection is commonly done by the Medical Examiner, but the Pathology Assistant must assist by turning over the body and may be asked to make a midline incision from the base of the neck to the top of the spinal column, reflecting back the skin on either side of the incision. The Medical Examiner will let you know if the spinal cord needs to be removed.

9.5 Posterior trunk dissection

The posterior trunk dissection is essentially the same as the posterior neck dissection, as the Medical Examiner will do the dissection. A midline cut is made from the top of the spinal column to the buttocks. The skin is then reflected back to examine for deep soft tissue bruises.

9.6 Vertebral artery or carotid artery angiography

Radiographic artery studies are done to assess injury to vessels, most commonly the vertebral and carotid arteries and to assess the cerebral vasculature. These studies need to be performed before the brain is removed and preferably before the internal thoracic organs are removed.

The vertebral arteries are injured most commonly with trauma to the head that usually results in subarachnoid hemorrhage. The vertebral arteries run along each side of the cervical spine and supply blood to the brain via the basilar artery.

The study is done by injecting contrast (usually barium) into one of the vertebral arteries, thus filling the arteries, including the cerebral arteries. An x-ray is then done to

assess the integrity of the vessels. This is done by inserting a catheter into the left vertebral artery. This artery is the first branch of the left subclavian artery and should be dissected out and identified by the Medical Examiner. The catheter is introduced into the lumen through a small incision and tied off below the tip of the catheter to prevent back flow. The right vertebral artery is the first branch off the brachiocephalic artery. After isolating this artery, a suture or string should be tied around the brachiocephalic artery to prevent back flow. Approximately 20-30 mL of contrast is injected into the right vertebral artery. Another 20-30 mL can be injected on the left. A standard AP x-ray of the head is then taken.

This procedure can also be done with the carotid arteries to assess the anterior cerebral circulation and possible injury within the cavernous sinus.

9.7 Posterior leg dissection

A posterior leg dissection is done in order to check to see if a decedent was struck from behind, for example, in a traffic accident. The dissection is done by making a cut down the posterior leg from the lower buttocks to the ankle. The skin is then reflected back to look for injury.

Other instances of where posterior leg dissection may be performed are to check for deep vein thrombosis when a pulmonary embolus is found. This is done by making a longitudinal incision down the popliteal fossa; skin is reflected, as is the musculature, exposing the popliteal vein. Transverse incisions are done to look for the presence of thrombi. This can be done down the calf by dissecting the musculature away from the bones and reflecting the muscles upward. Using a scalpel, transverse incisions of the reflected muscle will disclose the presence of thrombi. Firm, solidly-structured thrombi pop out from the vein (with the appearance of “sausages”), as compared to postmortem clot, which is flabby (“jelly” or “chicken fat”) and does not pop out.

9.8 Eye removal

In infant and child cases, the Medical Examiner may request to save the eyes. Vitreous should not be removed in these cases. This is done from inside the base of the skull and the Pathology Assistant removes the eye and optic nerve intact. The roof of the orbital plate is cut and chiseled away to expose the eye. The eye is then dissected out through the open orbital plate.

The eyes are then put into separate plastic formalin-filled containers labeled “OD” (right eye) and “OS” (left eye). The containers can then be added to the bucket where the brain, along with the spinal cord, is fixing for future neuropathological examination.

9.9 Middle Ear/Mastoid Air Cell Removal

In drowning cases and in some infant cases, the Medical Examiner may rarely ask to keep a sample of the middle ear or mastoid air cells. These are removed from inside the skull by cutting a wedge of the mid portion of the petrous bone using the Stryker saw and placed in a plastic cup filled with formalin.

9.10 Detection of Air Embolus

In cases where an air embolus is suspected, the Medical Examiner may ask to look for air in the heart. This is done by making an anterior incision in the pericardial sac and filling the sac with enough water to cover the heart. Hemostats can be used to elevate the pericardial sac around the heart in order for the water to stay around the heart. This procedure is best done using 2 people. After the sac is filled with water, an incision or stab to the right ventricle is made and the escape of the air in the ventricle will ascend up through the water as air bubbles. An inverted graduated cylinder can be placed over the heart, with the mouth of the cylinder in the pericardial water. When the heart is stabbed, the gas will escape into the cylinder displacing the water. Prior to performing this procedure, it is recommended to have 3rd party prepared to capture the air bubbles on camera, especially in homicide cases.

9.11 Detection of Pneumothorax

The skin and muscles of the injured side is reflected and dissected to form a pocket between the chest wall and the soft tissue/skin, which is then filled with water. A scalpel is introduced under the water level through the intercostal space into the costodiaphragmatic sinus. The scalpel should be twisted a few times. An inverted graduated cylinder may be used to collect and measure the amount of air.

9.12 Detection of Barotrauma

In a similar manner to the detection of pneumothorax, an examination for the extra-alveolar loss of air into the pleural cavity may be performed. This technique is most frequently used after diving accidents. It is recommended that two persons perform this procedure with a third person at the ready with a camera.

An “H”-shaped pocket is made in soft tissues of the anterior chest wall superficial to the rib cage. The “H” is made by making two horizontal incisions that are connected by a midline, vertically-oriented incision. These incisions will allow flaps of skin and superficial soft tissue to be retracted laterally and held using forceps; the pockets that were made by retracting the flaps can now be filled with water. It is recommended that one side be done at a time. A scalpel is introduced under the water level through the intercostal space and escaping air can be visualized and photographed (this will be a vigorous bubbling, not just a rare bubble).

SECTION 10

TOXICOLOGY SPECIMEN COLLECTION AND HANDLING

10.1 “Order of Preference” for Blood

The blood that is in circulation at the time of death (or at the time of the injury that eventually culminates in death) demonstrates the level of substances that a person may be under the influence of. Therefore, for antemortem blood, specimens obtained by the emergency department or on hospital day #1 are superior to later samples. Regarding postmortem (autopsy) blood, the order of preference for toxicological examination purposes, blood levels of certain substances may be artificially distorted relative to the proximity to the liver and the stomach, and can redistribute after death (bound drug in liver being released into the central blood). This is less of a problem in peripheral blood (especially if the inferior vena cava is clamped with a hemostat to prevent central blood being pulled into the peripheral blood specimen. Cavity blood is the least desirable, first, because organs may have occult (or not so occult) ruptures that allow spillage of drug or alcohol substances (such as from gastric contents) into the cavity. Also, cavity blood may be contaminated with dirt and other debris which may damage sensitive instruments. From most desirable to least desirable is as follows:

Peripheral Blood > Central (“Heart”) Blood > Splenic Squeeze Blood (essentially the same as central blood) > “Cavity” Blood.

10.2 Specimens to Collect during External Examination

The samples that need to be taken from an external view case are:

- Two gray top tubes of blood, either peripheral (preferred) or central
- Two red top tubes of urine (if possible)
- One red top tube of vitreous (subsequently split in half into two samples, if possible)

10.3 How To Collect Specimens during External Examination

The blood and vitreous should be collected using the 16 gauge needles and the 12cc and 60cc syringes. The preferred site for blood is the femoral vein. If necessary, a cut-down incision can be made in the inguinal region to visualize the vessel. Under no circumstances should a “blind stick” into the heart be performed. This is because the integrity of the blood sample cannot be ensured and gastric/esophageal contamination can occur. Vitreous should not be collected until after the Medical Examiner has examined the eyes.

To collect urine, the 8-gauge needle and 60cc syringe can be used. Insert the needle into the bladder just superior to the pubic bone.

10.4 Specimens to Collect during Adult Autopsy

Standard samples collected during an adult autopsy are as follows:

- Central (heart/great vessels) blood samples (1 gray top tube)
- Peripheral blood samples (2 gray top tubes)

- Bile sample (1 gray top tube)
- Vitreous sample (1 red top tube; subsequently split into two red top tubes)
- Urine samples (2 red top tubes)
- Gastric sample (50cc plastic specimen container)
- 100 gm sample of liver
- 100 gm psoas muscle
- DNA Cards

NOTE: The site of collection (“peripheral blood”, “central blood”, “cavity blood”, “spleen squeeze blood”, “subdural hematoma”, “bile”, “vitreous”, “urine”, et cetera, shall be recorded; the labels shall be placed on the respective tubes at the autopsy station.

10.5 Specimens to collect during Infant Autopsy

During the infant autopsy, the same samples as during an adult autopsy should be collected by the Pathology Assistant with the following exceptions:

- Use only the 12cc syringe with the 16 gauge needle
- Collect all of the blood possible.

10.6 Specimen Collection in Decomposed or Burned Bodies

In a case where the body is badly burned or decomposed, an attempt is made to retrieve all of the normal samples. However, if this is not possible, make the Medical Examiner aware of the limited sample. After the Medical Examiner weighs and examines the spleen, he/she may choose to perform a spleen squeeze to obtain blood. The Medical Examiner may also elect to obtain cavity fluid or maggots/pupae for toxicological analyses.

10.7 Miscellaneous Specimen Collection

If there is question that an accelerant may have been used to start a fire that caused the death, the Medical Examiner may put some of the remaining clothes into a sealed paint can to be sent to the crime lab.

VOLATILES / INHALANTS: In cases where an inhalant is suspected as contributing to death, the Medical Examiner may place a specimen of airway and lung in a special volatile/inhalant jar provided by Washington State Toxicology Laboratory.

10.8 Labeling of Specimens

After all of the samples have been collected, the Pathology Assistant should label each specimen with the proper labels for that case number and date (see Section 10.3; also see Section 2.0 – Paperwork). The specimens are then placed in a tube holder for the Medical Examiner to initial each one; both the Medical Examiner’s and the Pathology Assistant’s initials will be written by the Medical Examiner. The Medical Examiner will then set aside samples they want sent for analysis. The remaining samples are placed in a sealed specimen bag and placed in refrigeration for long term storage.

10.9 Preparing Specimens for Toxicology Laboratory

Routine autopsy specimens collected for toxicological analysis are to be sent to the Washington State Toxicology Laboratory (the Washington State Patrol Forensic Laboratory Services Bureau) daily. The completed toxicology form will be generated after the Medical Examiner has filled out the request portion of the form. The pathology assistant will complete the "Date Sent" and "Sent By" fields before packaging samples. A copy of this form and a copy of the investigative report front sheet will be sent with the specimens, along with a list of medications, if any are listed. These documents will make the toxicologist aware of the circumstances surrounding the death and any medications which may have been taken by the decedent.

Both the Pathology Assistant and the Medical Examiner will ensure that the tubes are well-sealed with the stopper. After initialing the tube labels, the Medical Examiner will wrap the tubes to be sent in absorbent material and then will place them into a small zip lock bag. The zip lock bag will then be sealed with evidence tape; the evidence tape will be initialed by the Medical Examiner. The Pathology Assistant will then place the bagged tubes into a Styrofoam mailer and insert that mailer into a mailing box with the paperwork for the case. When all the samples have been placed into the boxes, they are taped together and wrapped in brown paper and each end is sealed with packing tape. Prepare the samples for mailing by certified mail and leave at the front counter for the county mail courier to pick up. Do not mail samples on Friday, because the toxicology lab does not operate on the weekend. They should be stored in the secure tox refrigerator until mail delivery is to be effected.

Culture swabs and blood to be tested will be labeled and packaged for transport in a biohazard bag. Culture swabs and other samples (e.g., CSF) for microbiological testing will be placed in the proper transport media and/or sterile containers and will be promptly transported to Providence Regional Medical Center in Everett, Washington. Influenza swabs and frozen tissue will be placed in the proper transport media and/or sterile containers and will be promptly transported to the Washington State Public Health Lab in Shoreline, Washington. The various lab request forms are located in the morgue office. Fill out the form completely and attach the lab tracking label to the specimen. Transport to the lab as soon as possible. Place the MEO copy of the lab form in the case file and make the notation in the METS database.

The Toxicology Lab performs routine tests for ethanol, drugs of abuse, carbon monoxide and other volatiles. Acid and basic extractions are available. The Lab provides services to Washington State with more unusual tests sent out to other labs. Toxicology results are entered into METS by the pathology assistants.

STAT Carboxyhemoglobin determinations in cases of possible carbon monoxide toxicity can be sent to PACLAB, located at Providence Regional Medical Center in Everett, Washington.

Routine lab tests are done at the University of Washington Medical Center or at the Harborview Medical Center (HMC) in Seattle, Washington. Vitreous humor is analyzed at HMC. Vitreous to be tested will be labeled and packaged for transport in a biohazard bag. The HMC lab request forms are located in the morgue office. Transport the specimen to the lab in Seattle as soon as possible. Place the MEO copy of the lab form in the case file and make the notation in the METS database. Chain of custody forms will be filled out on all samples and specimens that leave the office.

10.10 Storage and Retention of Toxicology Specimens

Samples of blood, bile, urine, vitreous, liver & muscle and gastric contents are saved on each routine case for the purpose of toxicological study. After the initial toxicology tests are requested, the remaining samples are saved under refrigeration (except for liver & muscle samples which are frozen) for eight weeks, paired with the appropriate liver and muscle samples and all are placed in the freezer. These are then saved for three months after the case has been signed out by the Medical Examiner. Samples from cases classified as homicide or undetermined, are kept indefinitely in the freezer.

All the samples from each case that are to be retained in the freezer are packaged together in a 4mil plastic bag. Make sure that the tubes are properly stoppered and that the gastric contents are placed in a container with a screw-top lid. Each sample retained is logged into the computer under the case number in the database ice log.

DNA cards are retained indefinitely and are stored in the cytology room. Samples from these cards may be used for paternity testing.

10.11 Discarding Toxicology Specimens

Run a computer printout of all cases that are pending, homicides or undetermined as well as cases that are older than three months, but do not have a finalized autopsy report. Samples from pending cases are held in the refrigerator until determination has been made. All samples (other than those that are classified as pending, homicide or undetermined) from cases that have been signed out more than three months previously are placed in the bio-medical waste burn box for destruction. Rubatino Refuse Removal of Everett removes the hazardous waste. In addition to the routine samples, there may be hospital admission samples that require proper destruction.

SECTION 11.0

OTHER SPECIMEN COLLECTION AND HANDLING

11.1 Brain Fixation

When the Medical Examiner requests a brain to be fixed, the Pathology Assistant should fill a 2-gallon white bucket half full with a buffered formalin solution. A string is then placed underneath the basilar artery and pulled half way through, being careful not to tear the artery. The brain should then be lowered into the formalin and the strings secured to the bucket in a way that prevents the brain from touching the bottom of the bucket. The dura and any parts of the spinal cord that may have been removed are also placed in the bucket. The bucket should then be labeled with the case number and with the (unfixed) weight of the brain.

11.2 Heart Samples

11.2.1 Coronary Arteries

If a Medical Examiner requests to keep the coronary vessels for decalcification they are placed in a separate cassette labeled “decal” on the side and placed in a separate plastic specimen container filled with formalin.

11.2.2 Heart Sections

Occasionally the Medical Examiner will request to save a heart sample. The heart section is put into a plastic bag, sealed, labeled and kept in the freezer. They are kept indefinitely.

11.3 Cultures

Bacterial and viral cultures will be obtained when, in the Pathologist’s opinion, the results of the cultures would aid in establishing the cause and manner of death. When cultures are obtained they will be transported to the laboratory as soon as possible, preferably the same day.

11.3.1 Bacterial

Anaerobic and aerobic blood cultures

The Pathology Assistant should obtain a sterile sample of blood from the decedent by one of two methods:

- The first way and best way that a sterile blood sample should be retrieved is externally. The area around the subclavian should be sterilized by using alcohol wipes and then a sterile needle should be used to extract blood from the subclavian artery.
- The second way is internally. A propane torch should be used to heat up and sterilize a scalpel and once the scalpel is red hot it should be used to “sear” the

aorta and a sterile needle should be used to extract a sample of blood from this area of the aorta.

Once the sample is retrieved, the blood is put into two separate bottles labeled BD BACTEC Anaerobic and BD BACTEC Aerobic. The bottles are located in the main autopsy room. They are then promptly sent to the Microbiology Lab.

Bacterial swabs

When the Medical Examiner requests a swab, the Pathology Assistant must retrieve a sterile scalpel and sterile culture swab. After the swab has been taken, it is closed back in the tube provided and must be labeled with the case number, date and where the swab was taken from (i.e., "left lung").

11.3.2 Viral

Viral cultures are retrieved by the doctor in number of different ways, using a sterile scalpel to make an incision in an organ that is then swabbed. Nasal and airway swabs may be taken at other times. Once the sample is retrieved, it should immediately be placed in a viral sample tube appropriately labeled and transported to the microbiology laboratory as soon as possible.

11.4 Tissue storage

Representative samples of all organs are saved on every autopsy. The tissue is placed in stock containers filled with a buffered formalin solution. A paper towel may be placed on top of the tissue to assure that the floating samples are evenly fixed. These containers are stored and the tissue should fix in formalin for at least a month. The containers are labeled with case number, date of autopsy, case name and "stock tissue". The outside of the container will be labeled with a formalin warning.

After the tissue has been fixed, it is heat-sealed in plastic bags for storage. Tissue should be bagged once a week to keep a good stock of empty containers on hand. Usually 12 to 16 cases can be bagged at a time. To begin, place a paper towel in a large strainer/colander, next pour off the formalin in the stock jar into a sieve setup allowing the solution to drain into the ALDEX container. Aldex will neutralize and solidify the formalin. When this container is full, it can be disposed of in the regular trash. Next, pour the tissue onto the paper towel in the strainer. Check to make sure that the tissue is well fixed. If the tissue is not completely fixed, put it back into the stock container with new formalin and allow it to fix until the next time you bag tissue. If the tissue is completely fixed, find the plastic label and compare the case number with the computer generated label you have made. Wrap the tissue in the paper towel and place in a 4mil plastic bag. Add enough fresh formalin to cover the tissue and force the air from the tissue by compacting the package. Trim the top of the bag to within an inch from the top of the tissue and seal the bag with a heat sealer. Place this package in a second bag with the computer generated label and fold the top over before sealing.

The tissues are now heat sealed and double bagged with the label visible. The bags are stored on wire filing racks in the tissue storage room. The tissue storage room is ventilated and should be free of odors. If you detect strong odors or formalin, putrefaction or any other strong odor contact your supervisor immediately so that corrective action can be taken. Each package is filed by case number and the file box labeled as to the contents. The standard retention time for routine cases is five years. Tissue samples from homicide cases and cases with an undetermined manner of death are kept indefinitely. Tissue that is purged from the system will be incinerated with the biohazardous waste.

The empty stock containers are soaked in bleach water for a few days, then, washed out with soap. The containers are then thoroughly rinsed and air dried. They may then be reused for future cases.

11.5 THE VIRCHOW METHOD

The Virchow Method is an organ-by-organ method of evisceration and is seldom used in the office. The Medical Examiner may at times request this method of evisceration.

The opening of the body, sample collection and removal of the intestines is the same as in the modified block technique. Remove the organs in the following order after inspecting each for any abnormalities or irregularities. If at any step along the way you find evidence of trauma, stop and notify the Medical Examiner immediately. Always remember that you have to observe and inspect continuously during the evisceration and notify the Medical Examiner of any abnormality or injury.

Remove any remnant of thymus gland and open the pericardial sac. Note any irregularities in the pericardial fluid and measure if it appears to be an excessive amount. Slide a finger behind the aorta and pulmonary trunk to identify the *transverse sinus*. *Cutting through at this level will allow a check for a pulmonary embolus. Cut down the right and left pulmonary arteries to the lungs to be certain no emboli exist. Lift the heart at the apex and cut the major vessels of the heart from the inferior vena cava superiorly (pulmonary vessels, superior vena cava) and remove the heart.*

Free each lung of adhesions by lifting it from the thoracic cavity. Remove each lung by cutting along the mediastinal surface so that the pulmonary vessels and bronchus are flush with the lung. Once removed, the right and left lung can be differentiated by the number of lobes on each (three on the right). Place the lungs on the table with the cut bronchus up to avoid drainage or contamination.

11.5.1 Liver

To remove the liver, begin by freeing it along the diaphragmatic edge. While lifting the diaphragm, cut the falciform ligament at the ligamentum teres hepatis (round ligament) and continue to separate from the liver. Transect the hepatic veins where they join the inferior vena cava. Lifting the left lobe of the liver, cut through the left triangular ligament and separate the attachments to midline cutting the lesser omentum over the caudate lobe. Lifting the right lobe, cut the right triangular ligament and separate the attachments of the coronary ligaments to midline. Transect the portal vein and hepatic artery and lift the liver free.

11.5.2 Spleen

Removal of the spleen is simply accomplished by cutting the ligaments and splenic vessels at the tail of the pancreas. Make note of any accessory spleens that may be present.

11.5.3 Adrenal Glands

The adrenal glands, (suprarenals) are usually encased in fat. As their name implies, they are located above each kidney. The adrenals are quite delicate and should be dissected out with great care as they can be easily damaged. Once removed the left adrenal can be differentiated from the right by the shape. The right adrenal gland is usually triangular and the left more elongated.

11.5.4 Kidneys

Remove each kidney from its fatty crypt by making a longitudinal cut through the capsule. Strip the capsule from the kidney and transect the renal vessels and ureter at the renal pelvis. Leaving the ureter an inch long on the left kidney will help to keep it differentiated from the right kidney or you can make a cut longitudinal on the left and transverse on the right.

11.5.5 Stomach, Pancreas

Use blunt dissection to separate the connective tissues from the stomach by working from the outer edges lifting the fundus of the stomach and the tail of the pancreas together. Use similar technique to free the duodenum and pancreatic head. Applying traction to the organs superiorly, you'll have to cut a number of minor vessels and ligaments along midline of the body. Use blunt dissection to separate out the esophagus and transect 2-3 inches above the gastro-esophageal junction.

11.5.6 The Head and Neck

Done the same as in the modified Rokitansky method (section 7.6).

SECTION 12.0

THE HOMICIDE AUTOPSY

EVIDENCE COLLECTION AND CHAIN OF CUSTODY

12.0 Preparation

In addition to following the standard autopsy protocol, suspicious deaths or homicides must follow strict protocol in order to preserve evidence from the body. It is also important not to cross-contaminate trace evidence between a homicide case and various other bodies that are (or have been) autopsied at the SCMEO. New clean gloves should be worn whenever handling evidence.

The Medical Examiner should be present prior to opening the bag and during evidence collection. The body should arrive at the morgue in a sealed body bag, within which the body is wrapped in a new white sheet with the hands covered by paper bags. The body will be transported from the scene in a body bag sealed with a SCMEO integrity seal, which is to remain sealed until the Medical Examiner is present. The bag should be photographed showing the seal intact prior to removal, making sure that the seal is facing in the correct direction (so that the number can be read within the photograph). This seal is to be retained as evidence after its removal. The body will not have our case number written on it for identification as usual, but will have a hospital type I.D. bracelet or SCME tag attached to the body (usually the right ankle). If, for whatever reason, the SCME tag was not attached by the Investigator to the body, this tag can then be placed onto the body after the required steps of evidence collection and washing. Write the case number along with height and weight on the right side of the body after the initial examination and photographs with the black permanent marker pen.

Fold back the body sheet to access the body and roll the sides of the sheet up to retain any material that may come off the body. Evidence collection is done under the direct supervision of the Medical Examiner. All evidence is to be collected while the body is on this sheet and no evidence is to be removed without the Medical Examiner's consent. The body is not to be washed until evidence is collected. Trace evidence is removed by the Medical Examiner after photographic documentation of the evidence is taken.

Run appropriate homicide evidence labels from METS and use the evidence transfer sheet as a guide while collecting evidence.

12.1 Photography/washing body

The camera used for homicide autopsy photography is our standard Nikon D2X digital with compact flash memory card.

In each photograph that is taken, be sure you include our marker that has the case number and a ruler on it. When framing the shot double check to see that the ruler is in the same focal plane as the wound to be measured and that the camera is parallel to the ruler so that you obtain an accurate representation of the evidence. Each shot taken with a ruler should be duplicated without the ruler to show that nothing is present behind it. When taking pictures to document evidence, keep in mind that it is just as important to show the absence of injury or artifact as it is to show that injury which is present.

First, photograph the unbroken body bag seal with the number visible. The first photographs should be overall laterals from each side showing the condition of the body as it arrived at the morgue. The next photographs should show any blood spatter patterns and any other evidentiary material that may need to be removed, such as ligatures, tape etc. Any trace evidence removed should first be photographed to document the location of the evidence.

Suspected bite marks should be photographed immediately and the forensic odontologist should be promptly notified. **DO NOT WASH** the body until the bite marks have been photographed and swabs obtained by the Medical Examiner. Use an ABFO right angle ruler labeled with the case number when photographing the bite mark. Using an alternate (e.g. UV) light source and filter may also prove productive in visualizing the bite mark. Further evaluation and examination will be carried out by a board certified forensic odontologist.

After all evidence is collected, the evidence sheet can be carefully removed from under the body being careful to retain any possible evidence that may be on the sheet. The sheet is then placed into evidence and an evidence tag is placed on it and recorded. The body bag is next removed in the same fashion as the sheet and retained as evidence and given an evidence tag.

The body can now be washed. Confirm with the Medical Examiner that it is okay to wash the body. Quadrant photographs are the next photos to be taken and include: lower left lateral, from the waist down; upper left lateral, from the waist up; lower right lateral; and upper right lateral. Complete the general views by taking photographs of the back from the waist up, from the waist down and then take an overall view. Take a close-up of the face that will be used for identification purposes. All injuries must be

photographed twice. The first photo is to orient the location of the injury on the body. This needs to be far back enough to include an identifiable body part and to show which side of the body for the orientation of the location of the injury, but close enough to see the injury. The second photograph should be a close-up of the injury. All wounds should be taken with a right angle ruler labeled with the case number. Review photographs taken with the Medical Examiner to ensure all necessary photos are obtained before the autopsy.

Internal injuries will be photographed, as may be requested of the Medical Examiner. All bullets should be photographed prior to release of evidence. In addition, x-rays showing bullet fragments should be taken.

A CD-ROM containing the autopsy images will be made after the memory card has been downloaded according to digital procedures.

12.2 Radiology

All homicides require x-rays of the head and trunk, including the chest, abdomen and pelvis. Additional x-rays might be requested from the Medical Examiner, depending on the type of case and where any injury is located.

The x-ray settings are posted on the x-ray machine and technique has been previously discussed in the routine autopsy section (section 5.0). X-rays are taken in the anteroposterior (AP) position of the head, chest and abdomen. Position the head so that it is centered and the jaw is pointing slightly upward before aligning and exposing the first film. A lateral x-ray of the head should be obtained if there are bullet fragments present in the head as seen by the AP view. This will aid in localizing the bullets during autopsy. Place the film cassette in a plastic bag so that it does not become contaminated. The second film will include the chest; make sure to position the film cassette so that both shoulders are included and that the torso is flat on the film. The third exposure is a "KUB" type image of the abdomen and pelvis. Position the cassette so that the shot begins from the level on the abdomen where the chest film ended. Additional films of the extremities are taken as needed. Take an x-ray of every bullet wound. In some areas, a lateral film may be needed to pinpoint the position of a bullet or lead fragment.

12.3 Evidence Collection

Evidence collection is done under the direct supervision of the Medical Examiner and he/she must be present. An ultraviolet light may be used to help identify fibers and traces of semen on the body. An alternative light source such as an OMNICHROME may also prove helpful. Very small fibers should be collected by the Medical Examiner on clear tape and affixed to a microscope slide. The Medical Examiner may request

representative samples of insects and larvae be taken. These should be preserved in small vials of alcohol, unless otherwise specified by the Medical Examiner. Vegetable matter may be collected to verify that the body was or was not in an area where vegetation was present.

12.3.1 Hair Samples

Head hair samples are obtained when possible. Hair samples should be pulled, (not cut) prior to washing the body. Collect samples of hair from the three areas, left, right and top (center), pulling hairs at regular intervals from front to back. A minimum of 30 hairs per section is required, but be generous so that the crime lab will have more than enough. Wrap each sample in glassine paper so that it is folded over upon itself and the evidence is totally contained before sealing it in a labeled envelope. On decomposed bodies the entire scalp may come off. In this case collect and package the whole works.

Facial hair is collected in a random manner over the entire surface area. Again hairs are pulled and the samples are wrapped in glassine paper; beard and moustache hairs are packaged separately.

Pubic hair on a suspected sexual assault case should be combed through into a piece of glassine paper with a new comb that is stuffed with clean cotton. Collect any hairs, fibers etc. in a paper and seal the collected evidence and the comb in a labeled envelope. Pubic hair samples can then be pulled and sealed for transfer. Pubic hair is pulled on all other cases in a random overall sampling.

Hair around wounds should be shaved in order to more clearly visualize the wound edges. Be careful not to nick the skin and create artifact but if this does happen make sure you notify the Medical Examiner. Save all the hair that is shaved off and package the hair from each wound separately. Label the sample clearly so that there will be no confusion with multiple sample sites.

Additional hair samples may be collected from the chest, back or extremities of an unusually hairy individual.

12.3.2 Hands

Make sure that the paper bags on the hands have been labeled with case number and right or left, respectively. Open the bags only under direct supervision of the Medical Examiner by cutting longitudinally and fold the bag back allowing access to the hand without removing it from the bag. Open the bags over the evidence sheet to preserve anything that may fall out. The Medical Examiner will examine each hand and collect any foreign material present. Place the material collected in a glassine paper noting

where on the hand it was taken from. The Medical Examiner will inform you of any additional photographs of any unique blood spatter or injuries that need to be taken. The bags from the hands are then packaged in a larger envelope and saved as evidence.

If a gun was involved in the circumstances surrounding the death, obtaining primer residue swabs will be required (see related text). Allow the swabs to air-dry before packaging.

After the Medical Examiner has examined the hands and photographs of the hands have been taken, collect the fingernails using a clean scissors and/or nail clippers. The fingernails should be cut as close as possible without taking any tissue from the nail bed. (An alternative method is to first partially cut the nail (about one-half to two-thirds across) and then tear the remaining nail; this helps remove the nails in a controlled fashion). Cut the fingernails over the paper into which you will package them so that any scrapings from underneath the nail will be included. Package the nails from each hand separately in small glassine envelopes and package as evidence; the nail clipper is also into placed into one of the two glassine envelopes.

12.3.3 Swabs

In addition to the primer swabs, oral, anal and vaginal swabs are taken routinely on all homicide cases and cases of suspected sexual contact. Label microscope slides with case number and sample type with a pen that will not wash off during processing. You will need one each for anal, oral, vaginal and vaginal wash. The Medical Examiner will use anal and vaginal speculums to allow better access and ease of sampling. The Medical Examiner will swab the areas with 4 dry sterile swabs and streak the appropriate slide. Promptly fix the slide with cytology fixative or hair spray. The Medical Examiner may choose to do a vaginal wash. This is done by injecting approximately 5cc of sterile saline from a new syringe into the vagina, washing down the vaginal walls in the process. This wash is then recovered and put into a sterile, labeled red top vacutainer tube. A single drop is retained and placed on a microscope slide and allowed to air dry. The swabs are air dried before packaging and the slides are transported to the lab for a PAP stain. The slides are examined by the pathologist for the presence of spermatozoa. Place the dried swabs cotton end first into a labeled test tube and seal in an envelope. Ideally, the swabs should be kept frozen until they are ready to be examined. The Medical Examiner's does not examine the swabs for seminal fluid, DNA or serologic markers but does preserve and make the swabs available for these tests by another agency.

Additional saline swabs may be used to sample or collect substances from the body. These swabs should be air-dried and handled the same as the other swabs.

12.3.4 Personal Property

Personal property should not be removed without the Medical Examiner's permission. When removing property from the body, place it on the evidence collection table and circle around it with a pen, while making a notation as to where it was taken from. After it has been viewed and noted by the medical examiner, it may be photographed, packaged and sealed for transfer.

12.3.5 Clothing

Clothing should be described and logged on the SCME METS evidence form as in a routine case. In addition, each item of clothing is tagged with a numbered evidence tag. Each item of clothing is removed and placed in a separate paper bag. Keep the clothing items over the evidence sheet at all times while bagging it to catch any material that may come off of the clothing. Clothing that is wet should be hung up on clean hangers inside the rolling cage which is then moved to the locked drying closet until dry. Place clean paper under the clothing to collect anything that may fall off during the drying process. After the clothing has dried and is bagged, collect any material from the catch paper and submit as evidence.

The evidence sheet is tagged with a numbered tag and logged on the clothing sheet. Remove the body from the sheet and fold the sheet into itself so anything inside cannot come out and be lost. Place the folded sheet into a paper bag for transfer after it has dried completely. The packaged and labeled bags are sealed with evidence tape and placed in the evidence storage room with the rest of the evidence from the case.

12.4 Internal Evidence

The final resting position as well as entrance angles will be measured and documented by the medical examiner, so do not move or collect the evidence until this has been done. Two purple top vacutainer tubes (purple tops contain EDTA as a preservative) are filled with blood to be turned over to the responsible police agency for blood typing. The label on this sample should be initialed before packaging as evidence.

12.5 The Internal Examination

The autopsy precedes in much the same manner after the evidence is collected. The body is weighed and measured and opened in the usual manner. Be careful not to cut through any of the wounds and be aware of bullet path and wound tracks. The organs are removed using the modified Rokitansky method being very thorough with your observations and alerting the medical examiner to any hemorrhage or internal trauma. Do not run any water on the table if you have not recovered all the internal evidence.

Fluids from the body cavity may be strained through mesh or gauze to retrieve small fragments.

A purple-top tube of blood is collected as mentioned above. DNA paper is also used in every case, placing small drops of blood on the paper.

12.6 Evidence processing

All evidence and clothing that is collected is logged on the METS evidence transfer form. The clothing is listed within METS along with other processed evidence. The evidence labels are printed from the METS database on the printer. The Medical Examiner will initial the labels. All the evidence that is collected is packaged separately and sealed in a labeled envelope. A copy of the evidence list should be placed on the Medical Examiner's file before the evidence is sealed in the envelope and released. The envelopes are sealed with evidence tape along each seam and are initialed by the Medical Examiner to prevent tampering. Do not package any evidence in plastic bags, especially if it is wet or is to be preserved for fingerprints.

12.7 Evidence Transfer

The evidence from each case is locked in a separate locker in the evidence storage room. Swabs and blood are sealed and kept in the refrigerator until released. The evidence transfer must be signed over to the appropriate agency to preserve the chain of custody when it is released. Check each item of clothing and evidence against the transfer form when you release the evidence. After the evidence transfer form has been signed, make a copy for the investigating agency and place the original in the case file.

SECTION 13.0

ANTHROPOLOGY

13.1 Bones and Skeletal Cases

13.1.1 All bones, human and non-human shall have a SCME number assigned from METS. The bone or bones will be placed in the refrigerator by the investigator.

13.1.2 The pathology assistant shall bring the specimen out with the other daily cases.

13.1.3 The cases will be examined by the Medical Examiner and the Medical Examiner shall make the determination as to whether they are human or non-human. When necessary, the Medical Examiner may contact Dr. Kathy Taylor the Forensic Anthropologist from the King County Medical Examiner's Office.

13.2 Non-human bones

13.2.1 After the bones have been determined to be non-human, the pathology assistant shall photograph the bone/bones, making sure to take the photograph from different angles to capture characteristics used to distinguish the bones as non-human.

13.2.2 The bones shall be placed back into a bag and placed in the refrigerator. The investigator is responsible for disposing of the bones after the Medical Examiner has completed the appropriate paper work (note: when the Medical Examiner releases the remains in the "Body Release Authorization" section of METS, the words "non-human remains" should be written next to the Medical Examiner's signature).

13.3 Human bones (partial and complete skeletal remains)

13.3.1 If the bones are determined to be human remains, the Pathology Assistant shall first take a photograph of the bones with the bag or container the bones came in. The bones can then be photographed individually. This is best done with a dark background.

13.3.2 If there is soft tissue still remaining on the bones, a photograph of the specimen and the original bag should be taken as above.

13.3.3 After the Medical Examiner has dictated the original specimen, the specimen can then be processed and cleaned by boiling the bones to remove soft tissue. ABSOLUTELY no sharp implements shall be used to remove soft tissue from the bone. No bleach detergents should be used and the water should be kept at a low boil. The water level MUST be checked routinely to ensure the level has not evaporated below

the level of the bones. Bones should never be kept on the burner over night or at any time when they cannot be checked periodically.

1. A label should be applied to the pot containing the bones or at least adjacent to the pot so there is no confusion which cases is being processed.
2. If the first cycle of boiling does not remove all the soft tissue, the bones may be cycled again. However, the bones must stay in water in between the boiling cycles. They must never be allowed to dry and placed back in water for more boiling.
3. The water may be needed to be changed frequently throughout the boiling cycles, depending on the amount of soft tissue present on the bones.
4. The processing of bones, once begun, must take precedence to ensure a minimum cooking time and in between times.

13.3.4 Alert the Medical Examiner once the bones have been thoroughly cleaned of soft tissue and are ready for examination.

13.3.5 The bones shall be kept on a separate body cart labeled with the case number. They shall remain on the cart until the Medical Examiner directs otherwise. The bones shall NOT be separated unless directed by the Medical Examiner. If the bones are separated, a clear notation shall be placed in the case file in METS as to the location of the bones.

13.3.6 The Medical Examiner shall inform the assistant when they are completed with the case and direct the photographs that need to be taken by the assistant.

13.3.7 When the case is completed, the assistant shall place the skeletal remains in a box labeled with the case number and name of the deceased, if known. The assistant shall then inform the Medical Examiner that the bones are packaged.

13.3.8 The Medical Examiner shall release the bones per protocol if the deceased has been identified.

13.3.9 If unidentified, the labeled bones shall be placed in the specimen closet in the morgue.

13.3.10 A log shall be located in the specimen closet and completely filled out when the bones are placed in the closet. The bones shall NOT be separated unless directed by the Medical Examiner. If the bones are separated, the log shall be completed stating what bones were removed and to what location, in addition to a notation in the case file in METS.

13.3.11 Routine skeletal checks comparing the log to the remains in the closet shall be done monthly.

SECTION 14.0

POSTMORTEM EXAMINATIONS (COMPLETE VS. PARTIAL AUTOPSIES VS. EXTERNAL VIEW ONLY CASES)

14.1 Policy

The Snohomish County Medical Examiner's Office conducts three types of body examinations: complete autopsy; partial autopsy; external examination.

The complete autopsy is the primary form of examination performed at the Snohomish County Medical Examiner's Office. Partial autopsies and external examination are performed when the criteria described below are met and at the discretion of the Chief Medical Examiner.

Prior to examination the Medical Examiner shall assess the available information to determine whether an autopsy is indicated and to direct the examination. Every examination shall include the following preliminary procedures:

1. Medical Examiner review of the circumstances of death.
2. Initial preparation of the body (Section 3)..
3. The body shall be examined as clothed and unclothed, and the external physical examination shall be documented in METS. The documentation shall be written and with photographs.
4. Written documentation of the external examination shall include identifying features, signs of or absence of disease or trauma, and signs of death, including descriptive documentation and appropriate photographs of
 - a. Apparent age,
 - b. Height, weight, sex,
 - c. Apparent race or racial characteristics,
 - d. Hair and eyes,
 - e. Abnormal body habitus,
 - f. Prominent scars, tattoos, skin lesions and amputations,
 - g. Presence or absence of dentition,
 - h. Head, neck, thorax, abdomen, extremities, and hands, posterior body surface and genital, and
 - i. Evidence of medical or surgical intervention.

14.2 Complete autopsies.

Complete autopsies are conducted on the following:

1. All unexplained and unexpected deaths in adults and children, including infants.
2. Deaths that are thought to be the result of criminal activity.
3. Unnatural deaths that occur in custody.

4. Deaths that occur as the result of law enforcement actions.
5. Deaths that occur as the result of workplace accidents and/or injuries.
6. Deaths that are the result of acute intoxications including drugs, alcohol, and toxins.
7. Deaths that occur as the result of fire or where the body is charred.
8. Deaths that occur as the result of drowning or when the body is found in water.
9. Skeletonized human remains.
10. Deaths that occur as the result or are thought to be due to electrocution.
11. Deaths where the autopsy may aid in the identification of the body.
12. Any death where the Medical Examiner deems an autopsy is necessary for establishing the cause and manner of death.

14.3 Partial autopsies.

Partial autopsies are almost never performed. Only when there is a specific question, the answer to which, may influence the manner of death will a partial autopsy be considered. The practice is discouraged and only under special circumstances and with permission from the Chief Medical Examiner will a partial autopsy be allowed to be performed. Only certain types of cases are considered for partial autopsy.

14.3.1 Head-only examination in an elderly decedent to identify the presence or absence of injury to the brain.

Criteria:

1. The decedent is 60 years old or older.
2. The decedent is found dead on the ground after an apparent fall.
3. History and circumstances indicate that the death is a result of the fall and not a consequence of the death (e.g., a death followed by a fall).
4. Imaging studies were not performed and the presence or absence of head injury is not known.
5. There are no suspicious circumstances surrounding the death.
6. Examination of the head would help to clarify the cause and manner of death.

14.3.2 Head-only examination, suicidal gunshot wound to the head.

Criteria:

1. Scene investigation indicates that the manner of death is suicide.
2. The weapon is present at the scene and can be examined and compared with the entrance wound.
3. There is a single gunshot wound to the head.
4. The gunshot wound is a contact wound.
5. The law enforcement agency investigating the scene has no evidence that the death is something other than a suicide.
6. Another person was not present and in close proximity to the decedent at the time of the suicide.

7. The scene has not been disturbed or altered.
8. Indications of intent including written and verbal statements are helpful but not required.
9. The Medical Examiner may decide to perform an external examination only, especially when no projectile is retained in the head.

14.3.3 Liver-only examination in a decedent with an extensive history of liver disease.

Criteria:

1. The decedent is 60 years old or older.
2. The decedent has a long history of liver disease where a histological examination would help clarify the cause of death.
3. A small liver sample is easily obtainable.

14.4 External examinations (“view cases”).

Criteria for external examination:

1. The decedent is 60 years old or older. The decedent can be less than 60 years old but only if the decedent has a medical history sufficient to explain the death.
2. There is no evidence of significant injury on the body or at the scene.
3. There is no indication of use of illicit drugs or overuse of medication. An examination of the medications at the scene or those that accompany the body do not indicate excessive use.
4. The decedent has no known physician, or the decedent’s physician is unavailable or unwilling to sign the death certificate.
5. On rare occasions an external examination may be performed by a Medical Investigator or Pathology Assistant but only with the permission of a forensic pathologist. The report will then be reviewed by one of the forensic pathologists with the staff member and the Medical Examiner will date and countersign the case on the body diagram.
6. Decomposed bodies may have an external examination only, as long as the criteria above are met and the decedent can be positively identified.

14.5 Statistics and data collection.

The Medical Examiner’s Office will record the number of complete, partial and external examinations performed on an annual basis. This information will be available in the annual report.

SECTION 15.0

ANCILLARY TESTS

15.1 Policy

It is the policy of the Snohomish County Medical Examiner's Office (SCMEO) to undertake ancillary tests or procedures according to the standards set forth herein.

15.2 Radiology (See also Section 5, Radiology)

1. Radiographs shall be taken of the following:
2. All infants and suspected child abuse,
3. Explosion victims,
4. Gunshot wound victims,
5. Charred remains,
6. Decomposed remains,
7. Homicides
8. Aviation deaths, and
9. As needed for identification of the deceased.

See Section 5, Radiation.

15.3 Specimens for Laboratory Testing (Toxicology)

Specimens shall be routinely collected, labeled, preserved for laboratory testing, as follows:

1. Collect blood, urine, and vitreous;
2. Collect, package, label and preserve biological samples;
3. Document whether blood is central, peripheral, or from cavity; and
4. Additionally in cases that are autopsied, specimens of bile, gastric, liver, and muscle are obtained.

See Section 1, subsection 1.9.6; Section 2, subsections 2.2 and 2.7; Section 7, subsection 7.7, Section 10, and subsection 15.11 (below).

15.4 Histology

Histology examinations are performed on all cases that are autopsied.

Sections are taken and results documented in the autopsy report for

1. Coronary artery
2. Heart
3. Lung
4. Liver
5. Kidney

6. Brain, and

7. Other tissue as may be deemed necessary by the pathologist.

See Section 1, subsection 1.9.3.

15.5 Microbiologic Tests

Microbiologic tests are undertaken when there is a suspicion of an infectious disease process causing or contributing to the death.

15.6 Biochemical Tests

Metabolic tests are undertaken when there is a suspicion of a metabolic disorder causing or contributing to the death. A metabolic screen is conducted for all infant deaths under the age of one year. Metabolic screening cards are found in the morgue office and are collected at time of autopsy.

15.7 Genetic

Blood samples for DNA testing are collected on every case and are kept indefinitely.

15.8 Anthropological

Anthropological consultation is undertaken for skeletal and decomposed remains and when appropriate for biological profile for identification. Anthropological consultation is also undertaken for tool marks. See Section 13, Anthropology.

15.9 Odontologic

Odontologic tests and consultation are performed for identification of the deceased when other methods are not available and for bite marks in suspicious and homicide cases. See Section 12, subsection 12.1 and Investigations Policies and Procedures, section 6, subsection 6.6.

15.10 Neuropathology

Neuropathology tests and consultations are performed at the discretion of the Pathologist when cause and manner may be related to neuropathologic findings.

15.11 “STAT” Carboxyhemoglobin

For “STAT” Carboxyhemoglobin determinations, we use PACLAB (These are later confirmed by the WSTL.).

15.12 Forensic Sciences and Criminalistic

Trace evidence, bullets, tool marks, and other evidence items are collected and preserved for law enforcement / crime laboratory on homicide and suspicious cases.

15.13 Additional Testing Done at Pathologist's Request

During autopsy the Pathologist can request specific testing be ordered and done on specimens collected at autopsy. The pathology assistant will obtain the specific specimen to be tested (i.e. blood or vitreous) and place it in the correct specimen holder for testing (i.e. green top tube for Carbon Monoxide level or red top for Glucose and Beta-hydroxybutyrate). The pathology assistant will then fill out the appropriate form for the specific testing facility. These forms are located in the Morgue office. Whenever a specimen is sent out for testing, a copy of the form or tracking number is retained to document when and where the specimen was sent. If the specimen is picked up by a courier service they are to sign for the specimen before taking it.

There are times when we are requested to send specimens for additional testing. These may include sending additional specimens to the Washington State Patrol Crime Lab. When this is requested evidence forms are located in the Morgue office and are filled out and sent with the specimen to the lab.

In certain circumstances, the Pathologist or pathology assistant, will hand deliver the specimen to the lab with the correct form previously filled out by the Pathology Assistant.

15.14 List of Consulting Labs

1. PerkinElmer Genetics – Metabolic screening cards
2. Washington State Patrol Crime Lab
3. Washington State Department of Health
4. CellNetix Pathology and Laboratories – Histology
5. University of Washington/Harborview Lab Medicine
6. PacLab (Providence Everett Medical Center)

SECTION 16.0

RETENTION OF ORGANS AND TISSUES

16.1 Purpose

To establish guidelines for retention of body organs and tissues at the Snohomish County Medical Examiner's Office (SCMEO), including notification of legal next-of-kin of said retention.

16.2 Background

The National Association of Medical Examiners (NAME) recommends that there be "a written policy or standard operating procedure covering the retention and disposition of organ and tissue specimens taken at autopsy, that addresses whether, or under what circumstances, next-of-kin are to be notified of each retention."

16.3 Policy

The SCMEO Pathology Policy & Procedures Manual, Section 11, "Other Specimen Collection and Handling addresses retention of organs and tissues. Small representative tissue portions of organs (standard "stock jar tissues") require no special notification to legal next-of-kin. However, in some cases, a whole organ (usually the brain or heart) must be retained for specialized examination.

In cases of whole organ retention, it is the policy of the SCMEO to:

- 1.) Notify the legal next-of-kin that a whole organ has been retained;
- 2.) Explain to the next-of-kin the reason as to why the organ was retained;
- 3.) Consult with the next-of-kin regarding their wishes for disposition of the organ, once the examination(s) has been completed; and
- 4.) Document all conversations and maintain this documentation indefinitely.

A special form, "Disposition of Retained Organs", enclosure (a) will be utilized. The consultation with the next-of-kin will be documented in the Confidential Notes section of METS.

16.4 Responsibilities

Responsibilities for this Policy/Procedure are as follows:

1. All departmental personnel are responsible for reading and knowing the contents of this document.

2. The Pathology Assistant involved with the specific case shall assist and coordinate organ preparation for examination, including fixation, or conversely preparing the specimen for shipment to an expert consultant. Upon return of the specimen, the Assistant shall notify the involved Medical Examiner (pathologist) and will assist in the proper disposition of the organ.
3. The Chief Investigator (or his/her delegate) is responsible for making contact with the next-of-kin, explaining that a whole organ has been retained, and [using Enclosure (a) as a guide] obtaining final disposition information for the organ after the examination has been completed. Enclosure (a), although ideally initialed in person by next-of-kin, can be completed using the witnessed telephone conversation authorization method. If the next-of-kin refuses to sign, this will be documented and the Snohomish County Medical Examiner's Office will make proper disposition (e.g., as routine tissue destruction). In any event, the Chief Investigator (or delegate) will carefully document all conversations in METS. If next-of-kin cannot be initially notified, they will be notified after-the-fact of the retention once they are located.
4. The Medical Examiner involved with the case will ensure that the disposition instructions of the next-of-kin are complied with.
5. The Chief Medical Examiner (or his/her delegate) is responsible for annual review of this document and any necessary revisions.

16.5 Documentation and Records Storage

The final step is to properly maintain documentation. Organ and tissue retention and disposition records will be maintained indefinitely in the case file. Records of conversations regarding disposition requests will be indefinitely maintained within the Confidential Notes section of the case file in METS